GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

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SERVICE

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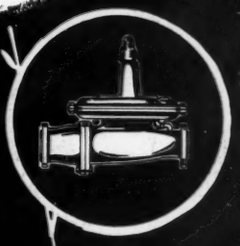

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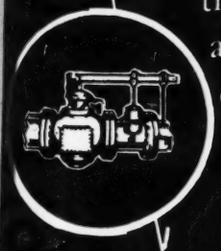

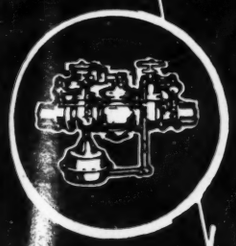

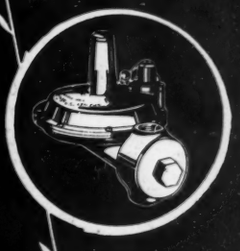

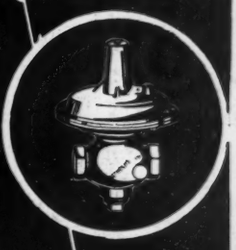

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RECOGNIZED GAS CONTROL SINCE 1892

AN ADDED MEASURE OF *Value*

FOR ADDED MEASUREMENT VALUE

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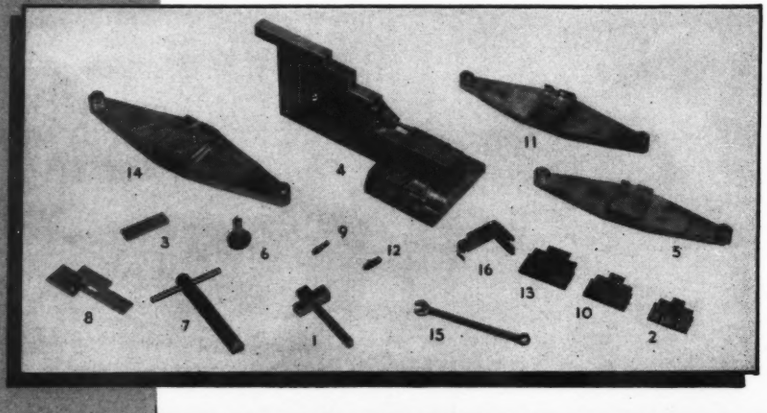

DURING the present emergency you may not be able to secure all the new meters that would normally be required for your expanded operations. Meter repair and maintenance work must, therefore, be done on a scale never before attempted. Here is where the inbuilt extras in EMCO Meters really prove their worth, for these meters have been designed with lasting qualities that provide high performance standards even after serving their normal life span.

EMCO Meters, too, can be renewed and modernized through the installation of interchangeable parts that incorporate, wherever possible, the latest advances in construction.

Good meter repair practice dictates the use of the best in tools and jigs to assure an accurately fitted job. Special factory designed equipment for this purpose is now available. Approved repair procedure for all EMCO and Ironclad Meters is completely described in our 80-page Repair Manual. Meter Shop Foremen, Distribution Superintendents and Measurement Engineers are invited to request it.

PITTSBURGH EQUITABLE METER COMPANY

NEW YORK BROOKLYN DES MOINES MEMPHIS OAKLAND TULSA CHICAGO BOSTON

MERCO NORDSTROM VALVE COMPANY
Main Offices, Pittsburgh, Pa.
NATIONAL METER DIVISION, Brooklyn, N. Y.

KANSAS CITY PHILADELPHIA SAN FRANCISCO LOS ANGELES SEATTLE HOUSTON COLUMBIA BUFFALO

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Every Down Stroke a Power Stroke

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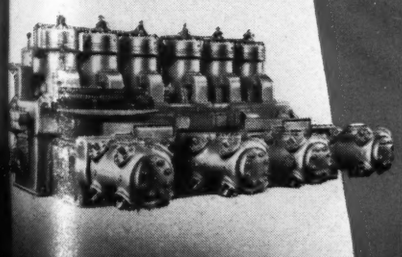

CLARK 6-Cylinder 600 H.P. "Super-2-Cycle" Angle Compressor

CLARK Super-2-Cycle

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GAS

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Eighteenth Year of Publication

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GUEST EDITORIAL

Tomorrow May Be Too Late!

By RALPH E. DAVIS

Petroleum and Natural Gas Engineer, Pittsburgh, Pa.

WHEN faced with the request that I write a Guest Editorial for *"GAS"*, it occurred to me that this would afford a convenient opportunity of advising men in the natural gas industry that their industry has made a splendid response to the Government's request that scrap metals be gathered and turned into trade channels. My recent survey of this situation indicates to me that the response has been most satisfactory and that scrap is continuing to flow in such amounts as it is available. In certain cases old standby plants or other standby equipment are being scrapped.

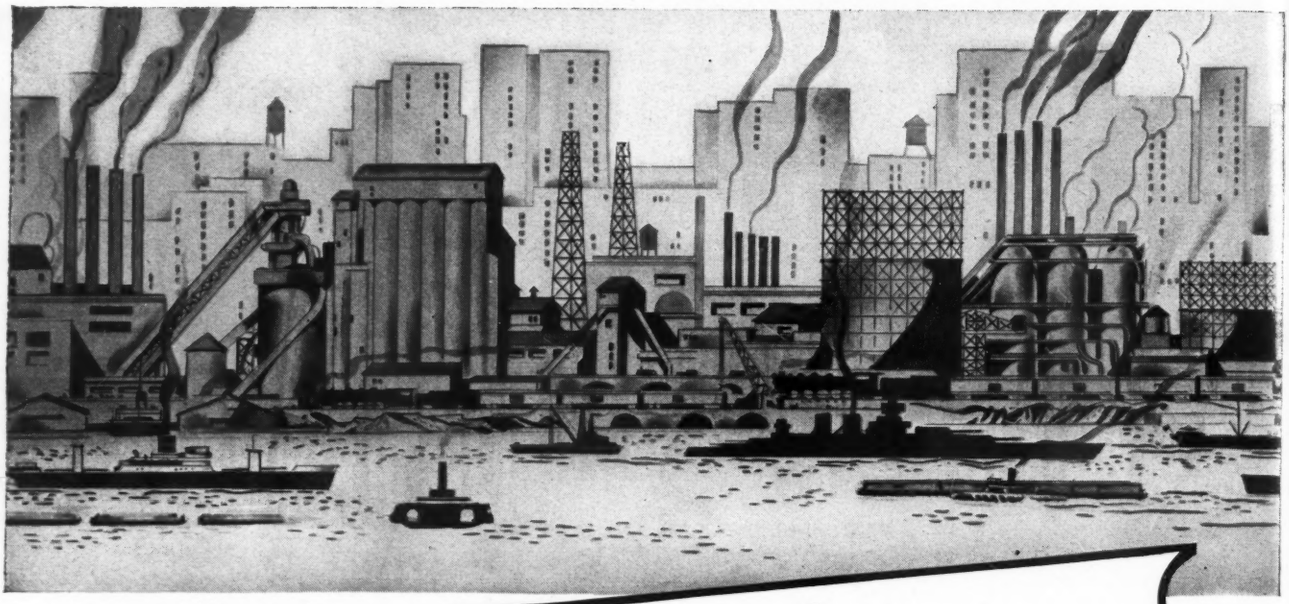
I got quite a kick out of a comment from one good fellow in the industry when he replied to my letter by saying, "A lot is being said about gathering scrap and maybe not too much being done about it." He was right in noting that there is a lot of talk. But nevertheless the natural gas industry has responded to this campaign most satisfactorily.

Realizing as I do that talk is cheap because it is so plentiful I should hesitate to write more. Nevertheless I feel that this is an opportunity to bring into black and white what so many of us are thinking today with regard to the way in which we are spending our time and efforts. During the past year I have devoted something like one-half of my time to problems that have at their end an increase in the production of oil or natural gas. So far, so good. The other half of my time has necessarily been devoted to problems that have at their end a decision as to whether or not certain companies will be permitted to, or will be required by Government to, do that which the management in one case desires to do and in another case desires not to do.

How I spend my time is of little importance, but it is very important that the men of long and successful experience in a vital industry be permitted to spend most or all of their time in efforts that will be

helpful in the winning of this war. And from my contacts I know that the way I spend my time and energy is a fair sample of what our industry's leaders are doing.

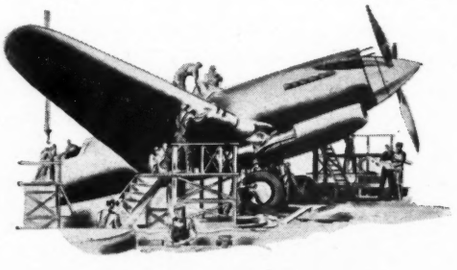
Too many Boards, too many Commissions, too many Rate Cases, too many Questionnaires, too much Red Tape, too many Little Fellows in Big Places. It all adds up to: TOO LITTLE and TOO LATE.



When the VICTORY STORY is written

WHEN THE VICTORY STORY is written the gas industry will have contributed a dramatic chapter. War-converted plants accellerate into armament output adequately provided with gas fuel and modern gas equipment. Cantonments and housing for war-workers and civilian services are supplied uninterruptedly. . . .

American Meter Company, along with other manufacturers in this vast service industry, is pledged to devote its capacity wholeheartedly to production for our armed forces. Meanwhile . . . still looking ahead . . . research goes on—striving toward greater post-war achievements.



AMERICAN METER COMPANY
INCORPORATED (ESTABLISHED 1836)

THERMALLY THINKING

By ELLIOTT TAYLOR
Washington Editor

The Month

OPA is irked by the clause in the Price Control Act that exempts public utilities from OPA regulation. Lacking legal authority it has substituted moral persuasion and sheer gall into the consideration of rate increase controversies before state commissions. Some commissions have cooperated since OPA is obviously always in opposition to any increases; others have resented trespass on their authority. OPA contends that gas, electric, and other utility rates are too important in the cost of living to be left outside the ceilings. Present indications are that broad wording of the new anti-inflation bill will accomplish what Henderson is after.

• •

WPB may have considered its action a little hasty in cutting off without any period of grace the manufacture of space heaters; has been making up for it by some liberality in the matter of granting appeals, permitting manufacturers to assemble partially fabricated units that were in the process of production. Momentarily expected is an amendment to the space heater order (L-173) exempting industrial unit heaters from its prohibitions. In the wind is another amendment that may allow all manufacturers a period of perhaps 90 days to finish up assembling the stocks they have on hand.

• •

Refrigerators now held in stock by dealers and utilities can be sold to anyone but at no increase over the ceiling prices. Manufacturers are permitted to add 1% per month to their prices to cover warehousing from February 14 to September 13. Servel is not passing this charge on to Servel accounts.

• •

Natural gas companies faced with the possibility of depleting their reserves to take care of the war market at dump load rates may expect an understanding appreciation of their problem at OPC. Whether this will have any effect on OPA and FPC remains to be seen. Look for OPC to have increasingly greater influence on WPB in the matter of releasing materials for necessary natural gas pipe line extensions.

Natural gas rationing in some areas is not entirely out of the question for the coming winter. OPC looks with favor on the gas companies that are already educating their customers to the necessity for conservation, hopes that 65° heating during winter peak day load demand may be accepted by enough domestic consumers to make rationing unnecessary. Oil rationing on the Eastern seaboard has come because voluntary conversion to coal was a flop.

■ ■

How Gas May Better Serve

IT has been our custom in times past to greet the gas industry in its annual convention assembled with a brisk round of editorial congratulation on the progress that has been made during the 12 months, and to end on the soundly cheering note of an optimistic forecast of even bigger and better achievements for the year ahead.

But the streamlined skeletonized two-day Annual Meeting of the A. G. A. opening this month in Chicago bears as little resemblance to the gusty vigorous assemblies of other years as the terse L Orders from Washington bear to our own polite effusions of the past. And while we could in all honesty point to the year since the last convention as one of monumental accomplishment in the grim and unwelcome task of preparing for and fighting a great war, we are fully aware of the fact that the industry has neither the time nor the temper to review its accomplishments to date in the light of mutual congratulations.

On the agenda of the meeting there are but two broad classifications of matters to be considered — how Gas may better serve in the interests of Victory, and how best it may plan for the new problems of Peace. More and more the participation of all industry in the war program is taking the form of obeying the specific orders emanating from the capitol, and this industry will be no exception to the trend. On management there rests less the responsibility to plan its specific war activities, than to see to it that every producing facility is operating at the degree of top efficiency that will best enable it to fulfill assignments as they are designated. We believe that already management has brought this industry to a high state of readiness and capacity to cope with any emergency, and that future demands will be met with the same alacrity in both spirit and performance that have been displayed in the past.

The problems of the post war era, however, cannot be viewed with complacency; and it is well that the distinction between the demands of a united nation at war and the ambitions of those who would impose as one of the dubious rewards of victory a new and unwanted social order on America, be kept ever in mind. Dictatorial powers, once handed to any individual or group have proven historically to be almost impossible of restoration to the body politic which first surrendered them.

With a few renegade exceptions, those who have believed that the greatest service to the nation could be rendered by privately owned public utilities, have in both word and deed remained steadfast in their convictions. It would be political juvenility to assume that those who have dreamed of a socialized super-state, having immediate and paternal jurisdiction over the lives and activities of all of our citizens, have abandoned that dream or abated in their determination to press for its fulfillment.

Questions of new taxes and of revised rate structures that will be necessary to meet the increasing costs of operation cannot be sidestepped because of the unpleasant implications that the enemies of private ownership will read into their introduction. While the fair rate of return principle may receive scant consideration, and in the case of some corporate financial structures may deserve little more than that, a return adequate to permit a continuance of the maximum physical service that any system can render cannot be disregarded.

Secretary of the Interior and Petro-

leum Coordinator Harold Ickes has said of the oil industry that it can best do its part to win victory if it be kept healthy and robust. Certainly the same good health is essential for the gas industry if it is to do its part toward the achievement of the common goal. One of the requisites of sound industrial health is adequate revenue. An industry gradually reduced to financial chaos cannot be expected to function with the effectiveness that an all-out war necessitates.

The essential reasonableness of this simple proposition must in time prevail. But the burden of its proof rests on the shoulders of utility management. To press for rate structures that will allow sufficient revenue to guarantee the greatest degree of efficiency in operation is neither a pleasant nor a popular undertaking. Yet without them all deliberations on both the immediate and the post war status of the industry become futile.

It has often been said of the gas companies, that they are damned if they do, and damned if they don't. But we'll be damned if we wouldn't rather be damned for doing than for don'ting.

A Short History of the United States

By CLIFFORD JOHNSTONE
Managing Director, Pacific Coast Gas Association

ONCE upon a time there was a great Wilderness peopled only by naked Aborigines. This Wilderness had many hills and dales and rocks and rills and also many Fertile Fields. These things became known to some Promoters who lived in other Countries and these Promoters sent their Engineers to investigate.

The Engineers made glowing reports and the Promoters decided to take a flyer. They advertised for labor and offered the best of the Fertile Fields and templed hills to those who would pay a Commission. They also mentioned something about throwing in Liberty as a Bonus.

The upshot of the Venture was beyond all Expectations. A lot of people wanted Fertile Fields and also Liberty, and the Aborigines had a hell of a time getting out of the way.

But there is a Snake in every Eden. Pretty soon the Promoters got to fighting among themselves, which was bad. What was worse, they found they had over-emphasized the Liberty argument, for the Laborers for whom they had done so much took her seriously and would not pay the Commissions. There were a lot of bad words said and pretty soon one of the Laborers shouted "Give me Liberty or Give me Death.. The rest of the Laborers thought this over and decided Liberty was best for them, too, so they took her. The Promoters' police force wasn't much good, so the Laborers got away with it.

Those Laborers were a Canny Bunch. They loved Liberty and wanted to keep her but they knew she was a pretty coy Babe and capricious to the point of Flightiness. Neither did they trust one another too much, for they suspected that there were still some of their number who preferred the Fertile Fields and would two-time Liberty to get them. So they built a Big House which they called the Constitution and they imprisoned Liberty in the house where everybody could see her. They put some guards around the house, who later came to be called the Nine Old Men. The visiting rules were very easy and the meanest Laborer could spend as much time with Liberty as could the President of the Union.

It was a swell layout and the Laborers were very proud of it. They advertised the situation in the other Countries. "Come and see our Liberty. She can't escape," said one headline. The byline was "We also have Fertile Fields —cheap." These ads had great pulling power and Slaves from all over came to visit Liberty and stayed to become Laborers to till the Fertile Fields which they took away from the Aborigines.

All the Laborers, old and new, got along fine and those who really tilled their Fertile Fields seriously and were smart enough to pull a little deal now and then did very well indeed. Everybody talked about Liberty and gave her all the Credit for their being so Happy.

Of course, now and then there would be Arguments. As we have said, Liberty was a bit flighty and she would sometimes kid the boys by talking to them in pig Latin, or parables or something. Then they'd argue about what she meant. Sometimes they would have to ask the Nine Old Men about it. These men lived with her in the Big House so much they could nearly always tell when she was kidding and they got to know most of her riddles. Only once did the Argument really bust out into a Real Fight. That was the time some of the Laborers thought that Black Laborers should not be given a look at Liberty. It was a whale of a fight, but it was finally settled that the Black Laborers could even call on and talk to Liberty if they wanted to.

The Promoters in other Countries watched all this with great fear, and well they might, for in some Countries the Slaves heard about it and borrowed Liberty's Sisters and fixed them up with Guards and things so that no one could hurt them. Of course, they kicked out their Promoters first.

There have been a lot of Funny Incidents. Every now and then some Laborer and his Friends figure out how fine it would be if they could kidnap Liberty so only they could see her. No one has gotten away with this yet, but sometimes the Big House has been picketed by groups of Laborers trying to keep everybody out but their Friends. These Groups usually call themselves by fancy names like The Trusts, The Farm Bloc, The Prohibitionists, etc. It sure keeps the Nine Old Men busy brushing them off. Liberty gets pretty sick of this and says she'll just die if she can't see everyone who wants to come. The Latest Group to pull this has a Slick Trick. It is trying to make itself look big and important by calling itself the Laborer which name of course applies to everybody. They even have some of the Nine Old Men fooled because they have so many Stooges in the Picket Line. Liberty knows better, though, and she's getting paler and paler every day and pretty soon she is going to talk right out in good plain words and the Nine Old Men will get busy. They always do when Liberty gets really hurt about something.

In the meantime the Confusion is tremendous and some of the Promoters in other Countries have gotten their Heads together and decided that it would be a good time for them to get some of the rocks and rills and Fertile Fields, etc., for themselves. They have an idea that Liberty may be getting old and wrinkled, thereby losing her Appeal to the younger Laborers who never having had a Promoter might think a nice young one would be better than their old Liberty. They even think some of the Laborers might like to become sort of Sub-Promoters if Liberty could be gotten rid of. So they have gathered all their Slaves and given them Guns and other things that Liberty hates and they are whooping it up something Scandalous. They have already caught several of Liberty's Sisters who went to work for other Countries.

Up until now a lot of the Laborers, particularly those who are called the Representatives, seem to be more interested in their own Arguments than in what the Promoters from other Countries might do.

It is a very Interesting Situation.
Liberty is Quite Ill.

GAS at WAR

Scrap Collection

Although utility companies have been in the forefront of the drive to collect scrap metals, the necessities of war production demand that even a greater effort and a greater success be made. In a recent bulletin from the American Industries Salvage Committee, 10 suggestions were made for improving the collection of industrial scrap. They are:

1. Head up the campaign by appointing an able executive of the company, armed with authority to act.

2. Use posters, illustrations, pay-envelope stuffers, and all other publicity means to enlist all employes in scrap campaign.

3. Comb plant and yards for dormant scrap and unusable and abandoned equipment.

4. Survey all plant equipment, particularly idle, standing or discarded machines.

5. Classify and segregate scrap and supervise its handling.

6. Make each foreman responsible for preventing spoilage and waste in his department.

7. Report promptly equipment which is obsolete. If equipment has not been used in three months, and it can't be proved that it will be used in the next three, turn it over where it can be used, or scrap it.

8. Salvage usable parts from equipment marked for scraping.

9. Speed return of scrap to mills and refineries through existing channels. Report regularly on collections of scrap to the Industrial Salvage Committee set up by the War Production Board in your community.

10. Enforce monthly re-checks in every department to find scrap material previously overlooked.

With the goal set at an average of 10 pounds of scrap for each employe in the Brooklyn Union Gas Co., Brooklyn, N. Y., salvage campaign, three men had already upset predictions by rounding up over 1,000 lbs. each. Leader in the early days of the collection was Jack Kirschner, transportation, who had deposited an even 1214 lbs. on the scrap pile. Items collected by Brooklyn Union employes included 40 baby carriages. An individual competition started among the employes themselves for the high man who carried in the scrap himself has developed keen rivalry, one worker bringing in 48 lbs. in one load by elevated, subway and bus from his home.

One of the important utility scrap collection yields recently came from the Cincinnati Gas and Electric Corp., Cincinnati, Ohio, when they recovered 600,000 lbs. of cast iron, by junking an abandoned river crossing. Lead also was recovered from the caulking in the joints.

Heading their announcement with the comment that "Believe it or not, the Japs are going to get a piece of the gas business," the Southern California Gas Co., Los Angeles, Calif., revealed the wrecking of old machinery that was used in the manufacture of briquets some years ago added up to 96 tons.

Floyd L. Carlisle, chairman of the Consolidated Edison of New York, Inc., serving as liaison officer between the American Industries Salvage Committee and individual companies in the Light and Power industry has written to all companies in the industry urging their support of the salvage campaign. He has also asked that reports be sent to him on the plans of each company for engaging in the scrap collection.

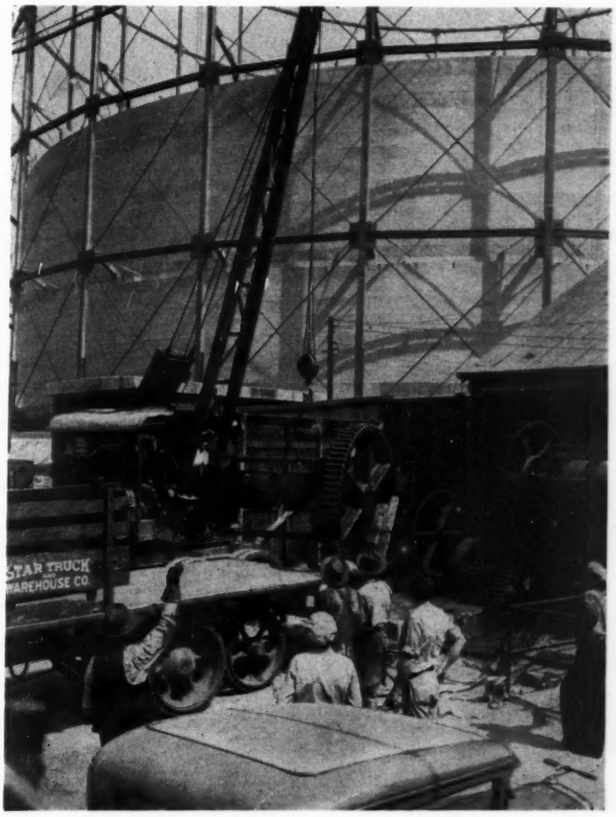
Washington Notes

Utility Maintenance and Repair: Amendment 4 to Preference Rating Order P-46 filed September 12 provides that materials needed by a producer for the construction of transmission, switching, and distribution facilities to serve either a project or equipment bearing an A-5 or better rating be assigned the same rating as signed to the project or equipment, except (1) where two or more ratings of A-5 or better are assigned, then deliveries to a producer of items containing copper, iron, or steel are assigned the highest rating; (2) in other cases the lowest rating is assigned.

Heat Treating Equipment: General Preference Order M-211, authorizing the WPB to establish production and delivery schedules of heat treating equipment in such instances as may be necessary.

Where schedules are established by the WPB, they are to be maintained without regard to any preference ratings assigned to particular contracts, commitments or purchase orders.

Refrigerators: Approximately 50,000



The briquet plant of the Southern California Gas Co., Los Angeles, Calif., non-operative since 1927 when natural gas completely supplanted the manufactured product in Los Angeles, is being scrapped to aid the war effort. Workmen are shown removing one of the immense gears that operated a press. It is estimated that 96 tons of metal will be salvaged from these machines alone. This will be turned over to the Reliance Regulator Co., Alhambra, Calif., now operating on a 100% war-work basis.

Officials in the Office of Petroleum Coordinator

Headed by Petroleum Coordinator Harold L. Ickes and Deputy Coordinator Ralph K. Davies, the executive organization of the Office of Petroleum Coordinator for War now consists of three assistant deputies, a chief counsel, four special assistants, one assistant to the deputy, one executive officer, and 12 division directors. These assistant deputies, and the divisions for which they are responsible, are:

Robert E. Allen: Transportation petroleum supply, materials, research, and general office administration.

E. DeGolyer: Production, petroleum reserves, and natural gas and natural gasoline.

Bruce K. Brown: Refining, marketing and facility security.

Serving as legal adviser to all divisions is the office of the Chief Counsel, J. Howard Marshall.

On the staff of the Deputy Coordinator as special assistants are: George W. Holland, James W. Frey, J. Elmer Thomas and W. F. Huff. Assistant to the deputy coordinator is Chandler Ide.

The executive officer, supervising administrative matters, is Stanley W. Crosthwait.

Directors of the various divisions are:
Production—Don R. Knowlton.
Transportation—J. R. Parten.
Marketing—Robert T. Collier.
Natural Gas and Natural Gasoline—E. Holley Poe.
Foreign—James Terry Duce.
Petroleum Reserves—W. B. Heroy.
Petroleum Supply—Robert L. Minckler.
Materials—Greer W. Orton.
Facility Security—W. D. Mason.
Research—Edward B. Swanson.
Public Relations—Gordon M. Sessions.

domestic mechanical refrigerators, frozen in the hands of dealers and distributors since February 14, were released for sale to the general public September 5 by order of the WPB.

Silica Gel: Silica gel will be placed under complete allocation and use control on October 1, by General Preference Order M-219, issued September 3 by the Director General for Operations.

Manufactured Gas: Delivery of manufactured gas to new industrial and domestic consumers was restricted by the designed to cope with gas shortages expected this winter.

After September 1, no gas may be delivered to a non-residential consumer for the operation of any gas-fired equipment which was not operated either by the consumer or on the same premises prior to that date, unless (a) the capacity of the new equipment is less than 150 cu. ft. per hour, or (b) the new equipment replaces existing gas-fuel equipment of the same or greater capacity, or (c) the Director General for Operations of WPB grants approval for the delivery of gas for the new equipment.

After September 1 no gas may be delivered for space heating, unless:

1. The equipment was installed prior to September 1. If the equipment was converted from some other fuel to gas, the conversion must have been completed by September 1.

2. The equipment replaces gas-fuel equipment of the same or greater capacity.

3. In the case of a new building, deliveries may be made to gas equipment installed prior to November 15, 1942, provided such gas equipment was specified in the construction contract and the foundation of the structure was completed prior to September 1, 1942.

Oil Production: A-1a and A2 preference ratings have been assigned to deliveries of all materials used in the production branch of the oil industry and those used for maintenance and repair purposes or as operating supplies in other branches of the industry.

Ratings were assigned in Preference Rating Order P-98-b, which was issued last month by the WPB upon recommendation of OPC.

■ ■

Meter Reading and Testing

Meter reading and billing continues to be an increasingly troublesome problem as manpower becomes more acute. Necessity being the mother of improvisation, numerous solutions have been offered and a few are being given tryouts.

New York: The Public Service Commission has granted permission to the New York gas and electric companies to use postcards for billing with a large anticipated saving in costs and materials.

New Jersey: The Public Service and Electric Gas Co. has announced that effective September 1 meters served by the company located in outlying territories will be read quarterly instead of monthly. The company reports the plan, evolved to curtail use of gasoline and rubber, will bring about a reduction of 75,000 automobile miles a year. Ultimately, the procedure will be applied to 75,000 of Public Service's one million customers. For the months in which the meters are not read, an average bill will be mailed to customers.

Meter Testing and Repair: Several utilities in Alabama have filed petitions with the Alabama Public Service Commission seeking to extend the required time for periodic testing from five to eight years.

The State Corporation Commission of Kansas has revised its rules by extending the former five-year periodic testing of meters to seven years.

Connecticut: The Public Utilities Commission of Connecticut has acted to conserve rubber and gasoline by approving amended rules of Hartford Electric Light Co. which provides for bi-monthly or quarterly reading of meters rather than monthly as at present.

Other States: The public service commissions of the states of Massachusetts, Michigan, Wisconsin, Georgia and South Carolina have approved bimonthly reading of meters in the present National Emergency either by electric utilities generally subject to their jurisdiction, or by the particular companies subject to their jurisdiction. The plan is also under consideration by the public service commissions of various other states.

Bombardier Jones has the Priorities
... that's why new Gas heating installations have been stopped by the War Production Board!
Portland Gas & Coke Company

Using a dramatic five-column newspaper advertisement which held its own in competition with war pictures from the world's battle fronts, Portland Gas & Coke Co., Portland, Ore., lost no time in interpreting for readers of the two metropolitan dailies the substance of the War Production Board's recent Order L-174 limiting new gas space heating installations.

A mythical but not unreal "Bombardier Jones" illustrates the need for sacrificing even a commodity like gas in behalf of the war effort. Copy goes on to explain the application of L-174 and the status of other gas service on the average customer. As a follow-up, to the newspaper appearance, a letter-folder containing a reprint of the advertisement was sent to each of 75,000 residential customers. Letters also were sent to 16,000 commercial and industrial customers, architects, builders and contractors.

Manpower Inventory

Advocating that business management make a prompt and thorough inventory of the manpower in its offices and plants in the same manner it would check and classify any other strategic material, Major General Lewis B. Hershey, Director of Selective Service, has warned American industry that a critical shortage is developing in the men and women who must keep the production front active for the duration.

Calling attention to the achievement of the Army in turning out a bomber pilot in eight months, he is asking that industry also cut the time formerly deemed necessary to train skilled workers and mechanics. On this basis, the Selective Service believes that six months is sufficient to train men and women for all but the most complicated jobs, and that in many cases this period can be easily reduced to 60, or even 30 days.

Employers may seek the deferment of their necessary men with or without their consent in the following manner.

On page 3 of the Selective Service Questionnaire (Form 40) which is sent to each registrant before he is classified is the following:

> INSTRUCTIONS—If your employer believes that you are a necessary man in a necessary occupation, it is his duty to fill out Form 42A requesting your deferment. You may also attach to this page any further statement by yourself which you think the local board should consider in determining your classification. Such statement will then become a part of the questionnaire.

This is on all the questionnaires distributed during the past six months. The fact that the Selective Service System now specifically mentions the filing of Form 42A as the manufacturers' duty is a clear indication of the Selective Service System view on the responsibility of each employer in this matter.

The employer can secure Form 42A at the local board and the local board will consider the employer's request when the form is filled out and signed.

If such request should be denied because the man, after consideration of the claims offered for him, is not considered to be indispensable to the company's operation, and is needed more in the armed services, the local board will advise the employer of its refusal of such an occupational deferment.

The local board does this by sending to the employer, at the same time it notifies the registrant of his classification, Form 59. There are 10 days after Form 59 is mailed by the local board to the employer during which the employer can appeal the registrant's case. The registrant will not be ordered to report for induction during this 10-day period.

In order to make an appeal the employer simply has to sign his name to Form 59 which he has received, and return it to the local board; or in case the Form 59 is not received from the local board, any written request will have full value to make such an appeal effective. When Form 59 is returned by the employer the appeal procedure becomes automatic.

All necessary forms are available at the local board in the employer's immediate vicinity or at the office of the State Director of Selective Service.

If the local board and the appeal board deny the appeal for the occupationel deferment of a key man, the employer may then bring the matter to the attention of the State Director at the State Selective Service Headquarters, with the request that the case be reopened or appealed by him to the President.

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War Report

In the "half way through 1942" statement of operations made to their employees as a supplement to the regular monthly house organ, The Brooklyn Union Gas Co., New York City, reported not only on the distribution of their income but also told what Brooklyn Union is doing in war activities. Presented in tabular and picto-graphic form, the report shows that 290 Brooklyn Union employees are in the service, that over $200,000 of war bonds have been purchased, that over 900 men and women have taken training in the Brooklyn Union Defense Corps, that thousands of women customers have been given nutrition training, and that Brooklyn Union is supplying gas to war industries and to the Brooklyn Navy Yard, as well as producing many by-products such as coke, tar products and light oils which are essential to war production at home.

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OPA Intervenes in Rate Case

Permission to intervene on the side of the City of Cleveland in opposition to the effort of the East Ohio Gas Co. to obtain higher gas rates in that city will be sought by the Office of Price Administration, Leon Henderson, Administrator, stated September 2.

This intention was revealed in a letter sent by Mr. Henderson to Mayor Frank J. Lausche, of Cleveland, in response to the latter's request that OPA cooperate with the city authorities in their efforts to prevent a rate advance in a proceeding now pending before the Ohio Public Utilities Commission.

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Civilian Defense Index

A free vest pocket, thumb-indexed Civilian Defense Index giving complete blackout instructions, explaining how to fight bombs, telling of precautions to take against gas attacks and containing first aid instructions has been made available by E. D. Bullard Co., 275 8th St., San Francisco, Calif.

THESE ARE THE FACTS OF RUBBER LIFE*

1. *Exposure to sunlight* deteriorates natural rubber rapidly and is a frequent cause of breakdowns. Therefore, it is important that all rubber products — hose, belts, tires, clothing, etc. — be protected from the sun's rays wherever possible.

2. *Oil, gasoline, grease,* and other products with a petroleum or vegetable oil content are harmful to rubber. These materials destroy rubber by eating into it, by rotting it, causing it to swell and lose its elasticity. Whenever possible to avoid it, oils and greases should not be permitted to come in contact with rubber; if it does happen, the rubber should be cleaned and washed as quickly as possible. There are special solutions for this purpose, but even soap and water are useful.

3. *Abrasion destroys rubber,* as it does everything else. In many instances it is possible to cut down frictional wear by checking all equipment over which rubber travels or which it touches, and making needed adjustment.

4. *Heavy overloads* on tires, conveyor belts, transmission belts, and other products cause strains that break down rubber and fabric, shorten their life. This condition can be avoided by strict observance of loading rules and closely adhering to operating regulations provided with the equipment, or easily obtainable.

5. *Excessive heat or cold* also destroys certain important properties of rubber, especially when a rubber product is subjected to severe heat (exceeding 150° F.).

6. *Constant bending and flexing* tend to shorten the life of many industrial rubber products, especially those not specifically designed for such service.

7. *Capacity to stretch* and return to its original shape is the most valuable property of rubber. It must be remembered that a rubber article which is kept under constant tension is much more susceptible to deterioration than the same rubber article at rest. For example, a hose if closed at the end and constantly full of water at high pressure will have only a fraction of the life of a similar piece of hose that is used intermittently.

8. *Rubber is not completely waterproof,* contrary to common belief. Hose and belting constantly drenched with water gradually absorb some of it. The moisture penetration to the cotton reinforcement and sometimes mildew and rotting can destroy the structure.

*From an article, "Don't Abuse Rubber—How to Prolong Its Life," by William S. Richardson, general manager, industrial products division, The B. F. Goodrich Co.—Reprinted from *Factory Management and Maintenance,* February, 1942.

IMPROVED IODINE PENTOXIDE APPARATUS

A.G.A. Laboratory Develops Flue Gas Analysis Test For Carbon Monoxide

By F. E. VANDAVEER

Assistant Director, American Gas Association Testing Laboratories

IF A selection were made of one instrument perfected within the past 17 years which had the most far-reaching and beneficial effect on the fabrication of gas appliances and their utilization, the iodine pentoxide apparatus for analysis of flue gas for carbon monoxide would be chosen. No other instrument would even closely approach it in importance. Many factors have contributed to this condition without which the present high degree of development of this apparatus would not have been possible. Undoubtedly the most important was the establishment of the American Gas Association Testing Laboratories in 1925 with its program of testing and approving gas appliances for compliance with national safety requirements. Success or failure depended to a large degree on the ability to insure that the combustion of gas in equipment approved by the organization would be complete on all fuel gases under permissible variations as supplied in the United States. To accomplish that objective, an instrument was required which would analyze for carbon monoxide to an accuracy of 0.002%, far below the maximum allowable concentration. This amount has now been established as 100 parts per 1,000,000 parts (0.01%) of air by volume for exposures not exceeding a total of eight hours daily and 400 parts per 1,000,000 parts (0.04%) of air by volume for exposures not exceeding a total of 1 hour daily. At the same time it was necessary to have an apparatus which would permit rapid determination of many samples per day and which would yield reliable and consistent results on a routine basis.

F. E. Vandaveer

DR. VANDAVEER received the Ph. D. degree in industrial chemistry from the University of Illinois in 1925. During graduate work he held a fellowship from the Illinois Gas Association and for a short time was cadet engineer with The Peoples Gas Light & Coke Co., of Chicago. He was employed as chief chemist by the newly established American Gas Association Testing Laboratories in August, 1925, and has been with that organization ever since. He has been successively responsible for appliance testing, inspection, and research activities. Later he was supervisor of the Pacific Coast Branch Laboratories in Los Angeles for four years. On returning to Cleveland he was appointed assistant director of the A. G. A. Testing Laboratories. For the past two years he has been directing research work, in addition to assisting in general administration of the Laboratories, under Director R. M. Conner. During this 17-year period he has presented a number of technical and semi-popular papers before various gas industry meetings, as well as chemical, home economics, mechanical engineering, and other groups. He is the author of many scientific papers, reports and technical bulletins.—Editor.

After experimenting with all known instruments for analysis of carbon monoxide at the time, including the Haldane, thermal conductivity CO-CO_2 apparatus, the hopcalite (M. S. A.) recorder, pyrotannic acid blood test, copper oxide combustion, cuprous chloride absorption, etc., it was decided that the iodine pentoxide apparatus as assembled by the Bureau of Standards had the best possibilities. Many changes were made in the apparatus designed and supplied by the bureau, and a simplified apparatus[4] was perfected.

Up to the time the American Gas Association Testing Laboratories were founded and the simplified iodine pentoxide apparatus was developed, most of the technical men in the industry and practically all of the gas appliance manufacturers had been analyzing for carbon monoxide with an Orsat, a Hempel, or similar gas analysis apparatus. The limit of accuracy on those instruments was 0.2% to 0.4%. Although a few men in the government bureaus and in the larger gas companies knew of the necessity for more accurate ana-

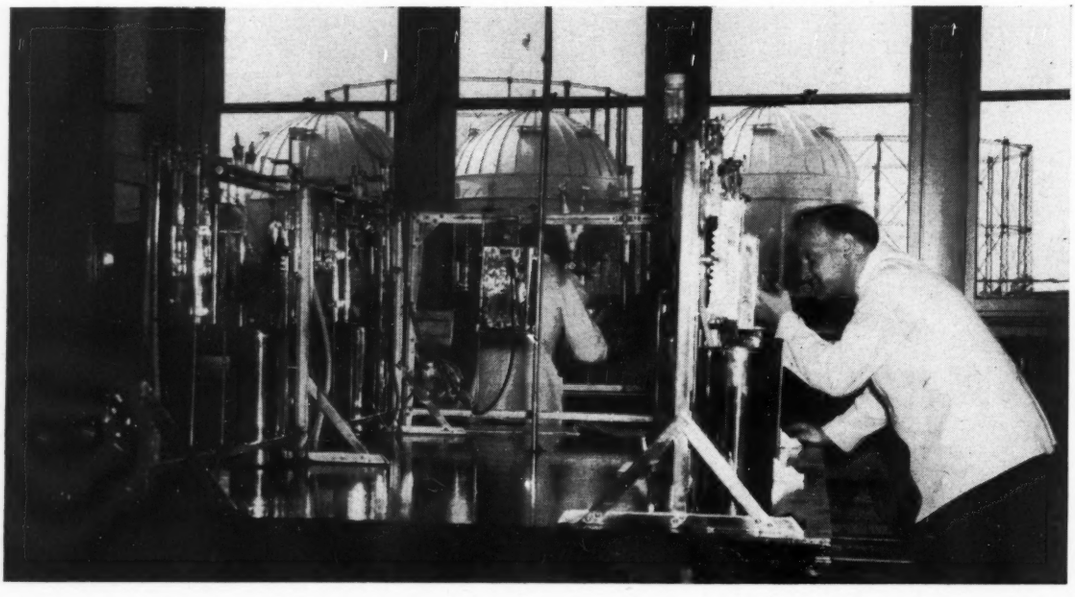

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FIG. 1
View of five I_2O_5 apparatus at Cleveland Laboratories, two on each side, one on end. Three spheres in background are East Ohio Gas Co. liquid natural gas storage holders holding the equivalent of 160,000,000 cu. ft. of gas.

▼

TABLE NO. 1

Accidental deaths from the absorption of irrespirable, irritating, or poisonous gases in the United States for the Year 1926-40.

Year	No. of Deaths (Accidental)	Rate per 100,000
1926	2,836	2.7
1927	2,521	2.3
1928	2,590	2.3
1929	2,617	2.2
1930	2,433	2.1
1931	2,095	1.8
1932	2,052	1.7
1933	1,668	1.3
1934	1,695	1.3
1935	1,665	1.3
1936	1,807	1.4
1937	1,704	1.3
1938	1,459	1.1
1939	1,396	1.1
1940	1,562	1.2

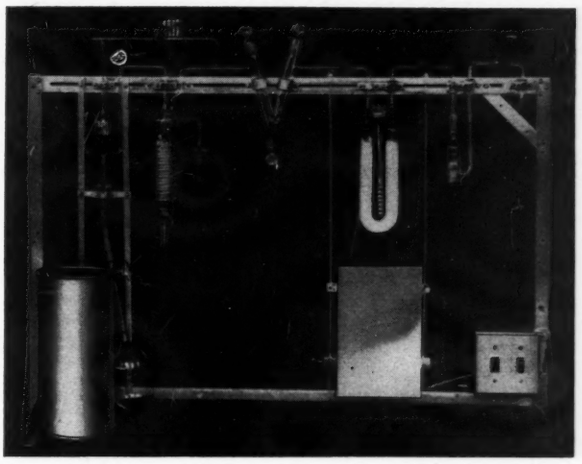

FIG. 2
Photograph of iodine pentoxide apparatus incorporating latest improvements.

lytical methods and were familiar with the new instruments, the industry as a whole had not been fully informed. It was therefore a sizable task to demonstrate the operation of the new instrument, prove its accuracy, and convince manufacturers of the presence of CO in small quantities when other instruments of limited accuracy showed none.

During the past 17 years the gas industry has become familiar with the necessity for analyzing for CO in terms of thousandths of a per cent instead of tenths. It is now taken for granted among gas men that gas appliances are designed to burn gas completely. American Gas Association approval certifies to that effect, and the solid foundation on which such approval is based is the iodine pentoxide apparatus. It has now withstood the test of time. Every conceivable means of checking it for correctness has been resorted to, including split samples, check samples, known purity samples, and calibration with other instruments. It is conservatively estimated that at the American Gas Association Testing Laboratories alone more than 190,000 determinations have been made on the seven instruments available there. Practically all of the large utility companies with gas utilization laboratories and appliance manufacturers who maintain a technical staff, possess one or more of these instruments. No other apparatus as satisfactory for the purpose has been developed to date, although the Mines Safety Appliances Co.'s carbon monoxide recorder using hopcalite is regarded as sufficiently accurate if the comparatively large volume of sample drawn will not influence draft conditions on the appliance. The M. S. A. CO indicator, which operates on a considerably smaller volume of sample, is finding increasing favor and is easier to manipulate. If proper precautions are taken, calibration checked periodically and manufacturer's instructions followed, it will give acceptable results.

The gas industry, as well as other industries depending on heat from the combustion of carbonaceous fuels, the medical profession, and U. S. Public Health Service now regard the iodine pentoxide method of analysis for CO in small percentages as standard. In American Standard Allowable Concentration of Carbon Monoxide, completed in 1941, the following statement is included: "Section 5, Analytical Methods 5.1. All methods mentioned in this code shall be standardized by the iodine pentoxide technique, or by the method of carbon monoxide air mixtures."

Further evidence of the success of the safety program of the American Gas Association and its accomplishments in insuring complete combustion on approved gas appliances is shown in Table No. 1, taken from "Vital Statistics[2]—Special Reports U. S. Department of Commerce, Bureau of Census" for the years 1926 to 1940.

No federal statistics exist which separate carbon monoxide from poisoning by other gases, such as hydrogen sulphide, benzene, carbon disulphide, ammonia, disinfectants, etc., nor do these data indicate the source of the poisonings whether from automobile exhaust gas, smoke, city gas, etc. Dr. Cecil K. Drinker[3] states that it is generally believed, however, that from 90% to 95% of the deaths recorded in the classification given in Table No. 1 are due to carbon monoxide, and that 500 to 700 of these total yearly deaths since 1935 are due to exhaust gas from gasoline motors. Some unknown portion of the totals tabulated above, but certainly not all of them, may be attributed to gas or gas appliances. It is incontrovertible, however, that such a great reduction from 2.7 per 100,000 in 1926 to 1.2 per 100,000 in 1940, this representing a decrease of more than 55%, is a real achievement. A large foreign nation without a national gas appliance testing program had an increase of 120% in deaths from CO for the period 1925 to 1935.

A number of improvements in the iodine pentoxide apparatus have been made since publication of a previous paper[4] in 1930. These changes have further simplified the apparatus, permitted easier manipulation, cleaning and repair, as well as more automatic operation. No change has been made in the basic principles and it still requires reasonable care and skill, and an understanding of the chemistry involved to keep the apparatus continuously in proper operation.

Description of Apparatus: For convenience in operation and to enable one man to conduct several analyses simultaneously, five iodine pentoxide units are located on a table in the center of the chemical analysis room at the Cleveland Laboratories. A general view of this arrangement is shown in Fig. 1.

A photograph of an iodine pentoxide apparatus embodying latest improvements is shown in Fig. 2. The sample of flue gases to be analyzed for carbon monoxide is drawn into the glass sample bottle (lower left) by water displacement from an aspirator bottle (of the type illustrated in lower left Fig. 3) containing a sample of flue products taken from an appliance. The sample bottle (approximately 500 cc. capacity) is immersed in water in the sheet metal container at left and the gas sample allowed to assume water temperature (measured by thermometer). The volumetric content of this sample bottle is accurately determined before tests are undertaken. The sample of flue gases is drawn through the apparatus by means of a vacuum applied to the capillary glass tube at top extreme right. In operation, a rubber tube with pinch clamp is attached to the glass capillary tube at upper left through which nitrogen for purging

the apparatus is supplied. When the sample of flue gases is being drawn through the apparatus the nitrogen flow may be continued if the vacuum setting is regulated so that the sample is partially withdrawn from the container. To remove the remainder, the nitrogen tube is manually pinched off until all of the sample is withdrawn. Nitrogen purge is then allowed to continue. Very little time of the analyst is required to watch the sample and prevent water being drawn into the I_2O_5 system. The sample passing up through stop-cock above sample bottle mixes with nitrogen in capillary tubing to right, enters the chromic acid tower, bubbles up through chromic acid to top right of tower, and passes to V-tube. This contains a 1-in. layer of granular potassium hydroxide, with glass-wool separating it from the phosphorous pentoxide which fills remainder of the tube. The sample next enters U-tube containing alternate layers of iodine pentoxide and glass-wool, heated by means of an electric air bath to 150° C., and finally passes through a Gomberg bulb in which it bubbles down through three layers of potassium iodide solution and out at the bottom to vacuum. In the chromic acid tower, maintained at room temperature, some moisture, unsaturated hydrocarbons, and aldehydes are removed. In the V-tube, potassium hydroxide removes acid spray, and phosphorous pentoxide removes all remaining traces of moisture. In the iodine pentoxide U-tube any carbon monoxide is oxidized to CO_2 and iodine liberated according to the equation:

$$5\ CO + I_2O_5 = 5\ CO_2 + I_2$$

Iodine vapor along with CO_2 and other flue gas constituents are drawn into the Gomberg bulb and the iodine is absorbed in potassium iodide solution.

Drawing the flue gas sample through the apparatus at the proper rate requires about seven minutes' time. After the sample has been drawn from the container, the nitrogen supply is continued. It is drawn down through vertical capillary tube at top left through a small mercury trap, out top of trap through glass tubing, chromic acid tower, and the remainder of the system through which the flue gas sample has passed. Purging for 23 minutes with nitrogen at same rate as sample flowed usually will be sufficient. Samples containing fairly high percentages (above 0.1%) of carbon monoxide will require a longer purge time, whereas samples showing no iodine color may be considered as completed at the end of 20 minutes' time.

At the end of analysis, approximately 30 minutes, two stop-cocks at upper right at inlet and outlet of Gomberg are closed, Gomberg bulb removed, its contents poured into a small Erlenmyer flask, and the bulb washed out with distilled water into same flask. Starch indicator is added to this solution, which immediately forms a blue color if any free iodine is present, and then the contents are titrated with 0.001N sodium thiosulphate until blue color just disappears. Equipment for this procedure is shown in Fig. 3. From the volume of thiosulphate used the percentage of carbon monoxide in the sample of flue gases may be accurately calculated.

The framework of the iodine pentoxide apparatus, illustrated in Fig. 2, is made of 1-in. angle iron, chromium plated, and is 38½ in. wide by 26½ in. high. Bottom supports resting on table are 17 in. long. Container at left bottom, Fig. 2, is made of copper and is 12 in. high and 5½ in. in diameter. The electrically heated air bath consists of two brass boxes, the outside one being 9⅝ by 6 1/16 by 4⅝ in., and the inside 8¾ by 4 by 2½ in. A 60-ft. coil of 22-gauge (B & S) chrome 1-A wire is wound on the insulation of the inside box. The remainder of the space between the two boxes is filled with asbestos fiber insulation. Temperature of the bath is automatically controlled at 150° C. by means of a Cenco DeKhotinsky thermoregulator. The funnel at the back of chromic acid tower is used for filling with chromic acid. The tower may be emptied by attaching a suction flask to the glass tube shown at right side of the tower. As shown in Fig. 2, the chromic acid tower is empty. In operation, the tower is filled to within approximately 1½ in. of the top. The V-tube, with inside leg dimensions of about 5½ by ¾ in., is filled with a layer of glass-wool at left top, below which is a layer of granular potassium hydroxide. Another layer of glass-wool separates it from the phosphorous pentoxide, which fills the remainder of the tube. Ground-glass joint stop-cocks are sealed in place with paraffin. The U-tube contains alternate layers of approximately ½ in.

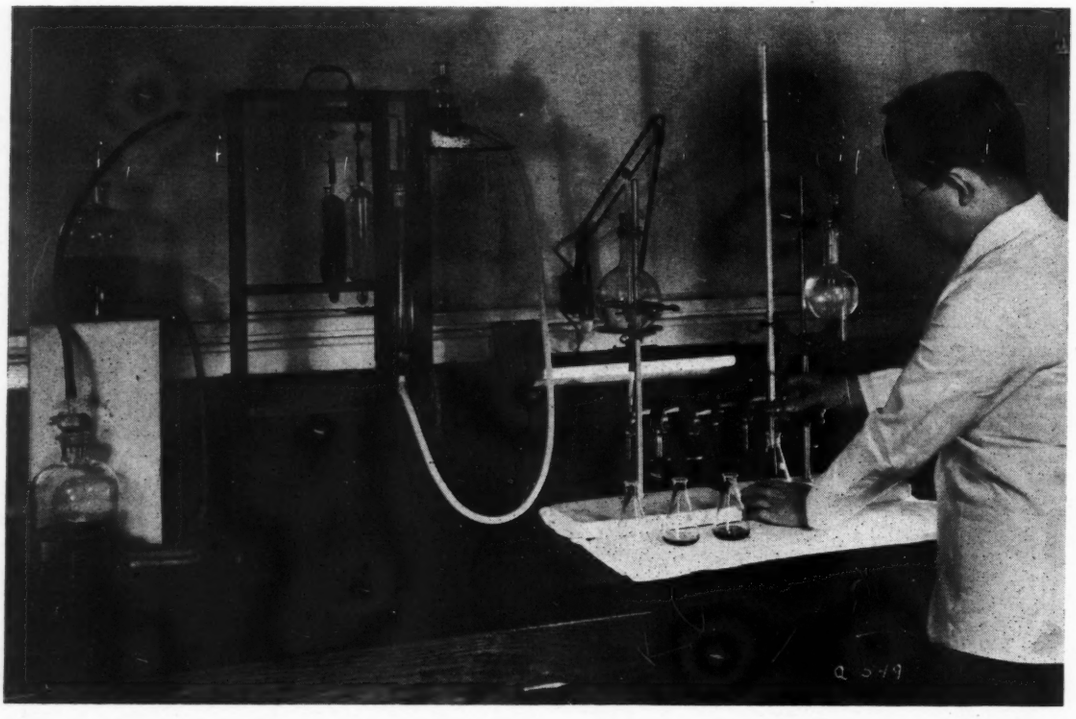

FIG. 3
Illustrating aspirator bottles for collecting flue gas samples for CO_2 and CO analysis, Orsat for CO analysis, and titration equipment for volumetric determination of iodine and subsequent calculation of percentage of CO.

depth of glass-wool and I_2O_5. Glassware may be either soft glass or pyrex. Glass tubing is approximately $\frac{5}{32}$ in. I. D. The box at the lower right corner of the framework contains the electric switch and a red telltale light to indicate when current is on. For manual operation of the electric air bath or to attain partial temperature control (leaving the automatic control to the thermoregulator) a 100 ohm, 1.5 amp. circular rheostat may be used in series with coil and regulator.

For convenience in operation and neat appearance, the vacuum, electric, and nitrogen purge lines are all run underneath the table top to the point below which connection to the apparatus is made. In Fig. 1, for example, the vacuum pipe line and the electric wire may be observed where they enter the center of the table top. The nitrogen cylinder, flow regulators, and pressure controls are located underneath the table at one end. A drawing of the nitrogen system is shown in Fig. 4. Nitrogen flow to the five I_2O_5 units is regulated by valve and dials on the right end of the nitrogen cylinder. The nitrogen gas flows up through rubber tubing to a glass T and bulb connection, the pressure being regulated so that some nitrogen bubbles through about $\frac{1}{2}$-in. layer of water and escapes to atmosphere when nitrogen is being used by all instruments. The main volume of nitrogen flows on to another glass T connected to a large test tube filled with about 2 in. depth of water and having a glass tube, as shown, connected to atmosphere. Normally, nitrogen flows on to a manifold, as shown, from which individual copper tubes extend to hose-end nozzles located on table top at proper point beside each I_2O_5 apparatus. A rubber tube with a pinch clamp connects from that point to glass tube of apparatus. With this arrangement sufficient nitrogen is available at all times; flow may be observed by overflow bubbles, and if for some reason a restriction occurs in system, air may be drawn in through left U-tube connection when suction exceeds 2-in. water column.

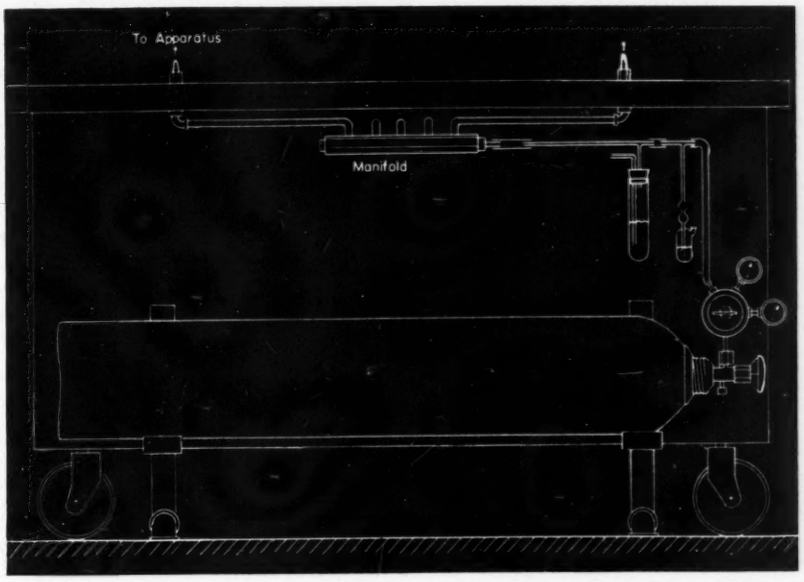

FIG. 4. Diagram of nitrogen purge system for five iodine pentoxide apparatus.

Preparation and Standardization of Chemical Reagents

Iodine Pentoxide: The tube of iodine pentoxide is maintained at 150°C. At this temperature the reaction with carbon monoxide is rapid and complete. There is also the added advantage of using this comparatively high temperature to keep the iodine liberated in the reaction from condensing on the walls of the capillary tubing leading from the U-tube to the Gomberg bulb. Iodine pentoxide of high purity, which has been found most satisfactory for this type of analysis, is known as iodic acid anhydride (Merck).

Pure iodine pentoxide does not decompose below 260°C., but the commercial grade usually contains lower oxides of iodine, iodic acid, and possibly other compounds, which decompose readily below this temperature. In order to prepare iodine pentoxide for use in analyzing for carbon monoxide it has been found by experience that the U-tube should be heated and maintained at a temperature of 205-215°C. for about 2 days, while air or nitrogen is being drawn through it at the same rate as for an analysis for CO. At this temperature all the unstable compounds which may be present in the material or acquired in sealing the material in the glass U-tube are decomposed and removed from the system. The temperature is next dropped to about 150°C. and purging continued for about 2 days more, after which the iodine pentoxide will usually be ready for use. No trace of iodine should be detected when starch is added to the potassium iodide solution when removed from the Gomberg bulb after 2 or 3 hours' purging of the apparatus with nitrogen. Once the iodine pentoxide is properly conditioned it will give satisfactory operation for a period of 6 months to a year or more when the apparatus is operated daily and if samples of reasonably low percentage CO are put through it. Each day a blank may be obtained in a comparatively short time (about 15 minutes) after temperature of 150° C. has been reached.

Chromic Acid: This acid is made by saturating concentrated C.P. sulfuric acid with potassium dichromate.

Potassium Iodide Solution: A solution of 10% by weight potassium iodide and 90% by weight of boiled, distilled water is used. This solution should be kept in a dark place. With proper care it will remain satisfactory for use for several weeks, but if allowed to stand in the sunlight it will slowly decompose, so that an indication of iodine will be found with starch indicator. The fresh solution should show no trace of free iodine. It is preferable to make up potassium iodide solution fresh every 3 or 4 days rather than to keep a quantity on hand.

Starch Indicator: Potato starch has been found to be the most sensitive indicator for iodine. It is sensitive to two drops of 0.001 N iodine in 20 cc. of solution, whereas wheat starch and soluable starch are sensitive only to three drops. To prepare the solution, dissolve 2 or 3 g. of starch in a few centimeters of cold water and add to 200 cc. of hot distilled water just after it stops boiling, and cool to room temperature. It is preferable to make this solution fresh every day, otherwise a distinct change from blue to white will not be obtained when titrating the iodine. Furthermore, when using an old solution the color change will be from blue to pink, which does not change readily to white and therefore gives an untrue end point. Another procedure which has been used successfully is to separate the clear starch solution from the heavier mixture which settles to the bottom of the container and use the clear liquid. By adding a drop or two of chloroform to this solution it may be kept in a dark place for several days without decom-

position and will give a distinct end point from blue to white.

Difficulty in securing the true end point may also be encountered if the purifying system of the iodine pentoxide apparatus is not properly removing sulfur dioxide or other acid gases to such an extent that the potassium iodide becomes saturated with them. When the iodine solution to be titrated is concentrated it is best not to add the starch indicator until most of the yellow iodine color has been discharged with the thiosulphate. If it is added to a concentrated solution a flocculent precipitate may result, which obscures a true end point.

Sodium Thiosulphate Solution: This solution should be approximately 0.001 normal; that is, 0.24820 g. per l. Before standardization it should be allowed to stand about four weeks so that equilibrium may be attained, after which its strength will remain constant for several months. The practice followed by the American Gas Association Testing Laboratories is to make up a quantity of 1/10N solution. Periodically a desired portion of this solution is diluted to approximately 0.002N and kept in this form for 2 or 3 months, by which time it has weakened to about 0.001N. Just before it is used it is standardized and then checked for normality at short intervals thereafter as long as it is used.

The thiosulphate solution may be standardized against pure iodine solution. Commercial iodine should be sublimed similarly to the method given in Treadwell-Hall's "Analytical Chemistry," Vol. II.

Pure doubly-sublimed iodine is weighed out very accurately to obtain approximately 0.001 normal solution, and whatever normality is obtained is taken as the standard solution. Iodine is very hygroscopic and vaporizes easily, so it is necessary to use special precautions in weighing. About 2 g. of potassium iodide and a few drops of water are placed in a weighing bottle and weighed. About 0.2 g. of iodine is then added and weighed again. The difference in weight is the exact amount of iodine. The solution is then made up to one liter with distilled water. If desired, the normality of the iodine may be checked by arsenious oxide, as outlined by Treadwell-Hall. However, for ordinary purposes the iodine weight and, therefore, normality may be taken as correct.

The sodium thiosulphate solution is then standardized against the standard iodine solution, using starch as the indicator.

To convert the thiosulphate into terms of carbon monoxide, the following typical calculations are involved:

If 0.0974 g of I_2 is weighed out per 1000 cc, 1 cc solution = 0.0000974 g I_2. By titration 10 cc I_2 = 8.37 cc $Na_2S_2O_3$.

Then 1 cc $Na_2S_2O_3$ = 10/8.37 = 1.195 cc I_2, or 1 cc $Na_2S_2O_3$ = 1.195 × 0.0000974 = 0.0001164 g I_2. 1 cc $Na_2S_2O_3$ = 30,701,720/64,674.59 × 0.0001164 = 0.0552 cc CO at 60°F. and 760 mm Hg.

Derivation of the factor $\left(\frac{30,701,720}{64,674.59}\right)$ for changing cc $Na_2S_2O_3$ to cc CO is fully explained in a previous paper[4] and need not be repeated here.

Care of Apparatus: To keep the apparatus in good working condition certain precautions must be observed. Chromic acid, potassium hydroxide, and phosphorus pentoxide must be replaced periodically, and the glassware kept clean. In heating up the I_2O_5 and in cooling it down, moist air should never be allowed to enter the I_2O_5 tube; stop-cock on the outlet of the tube is kept closed and those on the inlet left open, including the one above the chromic acid tower. This permits expansion and contraction due to heating and cooling to take place through the phosphorus pentoxide V-tube and by-passes above the chromic acid to the air. The Gomberg bulb should always be disconnected or removed during this process to avoid any possibility of potassium iodide getting back into I_2O_5 tube. When chromic acid begins to change color on continued use it should be replaced. Likewise, when the top layer or two of phosphorus pentoxide becomes pasty from absorbing moisture the tube should be refilled. Periodically the inside of the glassware up to the I_2O_5 tube should be thoroughly cleaned to remove particles of mercury, grease from stopcocks, and solids from chemicals which collect after long use. It is preferable to use weak chromic acid for this cleaning operation. Weak nitric acid is used to remove mercury. Pipe cleaners are also useful in removing particles of all kinds within reach. Never use ether, alcohol, or other organic liquids for quick drying as it takes a long time to secure proper performance of the I_2O_5 thereafter. Best procedure is to draw or force warm, dry air through the apparatus after cleaning (but not through the I_2O_5 tube) until it is thoroughly dry before putting chemicals back in chromic acid tower and phosphorus pentoxide U-tube. Occasionally (once a month when in daily use) it is good practice to heat up the I_2O_5 to 200°C. for a short time and drive off any accumulated partially decomposed oxides of iodine.

OPEN TEST ROOM . . . CARBON MONOXIDE

Appliance: XYZ No. 2300. Date: 3-27-41.

Type of appliance: Booster Water Heater.

Gas: Natural Heating value: 1100 Sp. Gr.: 0.65

	0.5 N	*N*	*1.25 N*	*1.5 N*	*CO in Atmosphere*
Sample No.	E	A	11	U	.....
Manifold Press, H_2O	3.5	7.0	8.75	10.5	.....
Barometer Reading—in. Hg.	29.28	29.28	29.28	29.28	.....
Meter Press.—in H_2O	3.5	7.0	8.75	10.5	.....
Meter Temperature—° F.	73	73	73	73	.....
Correction Factor	0.950	0.959	0.964	0.968	.....
Volume Metered—cu. ft.	1.0	1.0	1.0	1.0	.....
Time—Sec.	36.5	25.5	23.0	21.0	.....
Rate—cu. ft. per hour	93.7	135	151	166	.....
Rate—B. t. u. per hour	103,000	149,000	166,000	182,500	.....
Volume Sample	514	583	583	514	.....
Temp. Sample	77	77	73	73	.....
Correction Factor Sample	0.932	0.932	0.943	0.943	.....
CO Readings—(2)	34.65	35.55	36.50	3.15	.....
(1)	33.85	34.65	35.55	1.50	.....
Diff.	0.80	0.90	0.95	1.65	.....
Factor	0.0495	0.0495	0.0495	0.0495	.....
CO in Sample—%	0.00826	0.00820	0.00854	0.01685	.....
CO in Atmosphere—%	.....	.....	.....	.....	0.0
CO in Flue Gas—%	0.00826	0.00820	0.00854	0.01685	.....
CO_2 Flue Gas—%	5.6	8.1	9.0	9.9	.....
CO_2 Air Free—%	12.2	12.2	12.2	12.2	.....
Air Free Factor	2.18	1.51	1.36	1.23	.....
CO Air Free—%	0.018	0.0124	0.0116	0.0207	.....
CO Air Free—Ave.	.....	.....	.....	.....	.....
Conc. in 1000 cu. ft. room	.....	.....	.....	.....	.....
O_2 in flue gas—%	.....	.....	.....	.....	.....
Orifice size	.....	.....	.....	.....	.....

Remarks: Analyst—N. F. S.

FIG. 5. Sample combustion test record sheet used at A. G. A. Testing Laboratories. It includes gas adjustment data on an appliance and analytical data on carbon monoxide in flue gas obtained with iodine pentoxide apparatus.

Effect of Various Gases on Iodine Pentoxide: In a previous paper[4] it was shown that all gases which may be present in fuel gases or in the products of combustion of gas, such as carbon dioxide, oxygen, hydrogen, methane, ethane, hydrogen sulfide, sulfur dioxide, nitrogen, and oxides of nitrogen, in small quantities have no noticeable effect on results obtained on the I_2O_5 apparatus. Aldehydes are oxidized only partially by chromic acid at room temperature, so when these vapors are present in flue gases they would not be entirely removed in the chromic acid tower and would accordingly be oxidized in the iodine pentoxide tube and reported as carbon monoxide. Such exceedingly low percentages of aldehydes are found in flue gases, even under conditions of most incomplete combustion that they would never have any appreciable effect on the percentage of CO reported. Furthermore, aldehydes are just as undesirable as CO in products of combustion from gas appliances, and it is therefore considered an added safety measure if the I_2O_5 does oxidize aldehydes, and the result is recorded as CO. Where relatively large quantites (0.04 to 1.9%) of unsaturated hydrocarbons, such as ethylene, propylene, acetylene, etc., are present in products of combustion, correct readings for carbon monoxide on the I_2O_5 apparatus, as described herein, cannot be obtained. A more elaborate purification system to remove these hydrocarbons before they enter the I_2O_5 tube would be necessary in order to secure correct results on percentage of carbon monoxide present.

Combustion Test Records: A typical combustion test record sheet as used at the American Gas Association Testing Laboratories in determining percentage CO in flue gases from gas appliances is shown in Fig. 5. The four vertical columns contain data taken at ½ normal gas pressure, normal pressure, 1.25, and 1.5 times normal pressure with no change in adjustment of gas or air after the settings are made at normal pressure. Referring to the column under N (normal gas pressure) as typical of the other three, the first nine rows of data (under sample number) record data needed to obtain the gas input rating to the appliance in Btu per hr (149,000). The next eight rows record data secured by iodine pentoxide method for determining carbon monoxide in sample as taken from an appliance (0.0082%). Calculation involved is given below:

$$\frac{0.9 \times 0.0495^* \times 100}{583 \times 0.932} = 0.0082\%\ \text{CO}$$

To convert the CO in sample to an air-free basis, CO_2 in sample is determined by Orsat analysis (8.1%), the ultimate CO_2 for the test natural gas was known (12.2%) giving an air-free factor of

$$\frac{12.2}{8.1} = 1.51$$

Multiplying CO in sample, 0.0082, by the air-free factor, 1.51, gives a percentage of 0.0124 on an air-free basis. By such a conversion all errors in sampling, minor variations in room conditions, drafts, etc., are eliminated. It has further advantage of being a standard basis for comparison between samples taken on different days and on different appliances. It is analagous to converting gas volumes to standard pressure and temperature conditions.

*cc. CO at 60° F. and 760 mm hg = 1 cc. thiosulphate as used in this analysis.

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4. Simplified Iodine Pentoxide Apparatus for Determination of Carbon Monoxide in Flue Gas, F. E. Vandaveer and R. C. Gregg, Jnl. Ind. & Eng. Chem., Analytical Ed., Vol. 1, p. 129, July 15, 1929.

*For more complete bibliography on iodine pentoxide method of analysis for carbon monoxide, refer to:

a. Paper listed in "4," above — 27 references are given.
b. Book by Dr. C. K. Drinker listed in item "3," above—34 references are given in Table 17, pp. 200-201 and bibliography, pp. 223-246.
c. L. B. Berger and H. H. Schrenk, Methods for the Detection and Determination of Carbon Monoxide, Tech. Paper No. 582, U. S. Bureau of Mines, 1938.

Lead-Base Soldered Joints in Copper Tubing

THE use of copper pipe for domestic plumbing lines and certain other purposes was greatly retarded until the development of a satisfactory soldered joint made thin-walled hard-drawn copper tubing practicable for such service.

Recently, as part of a general program sponsored by the Copper and Brass Research Association, the merits of tin-base soft solder for these joints were studied and a favorable report was issued (BMS58). However, it was found necessary to recommend that the use of the soldered joints be limited to service in which the prevailing temperatures did not exceed 250° F.

Supplementing this early work, a study has just been completed on similar joints made by the use of lead-base solders. An important aim in this work, which is described in detail in Building Materials and Structures Report BMS83, was to find a solder that could be recommended for use at temperatures higher than 250° F.

Joints made with lead-base solders of the following types were tested: Lead-silver, lead-cadmium, lead-tin-antimony, high lead-low tin, and high-purity lead. Specimens made by joining two short pieces of copper tubing by a soldered sleeve coupling were tested at temperatures ranging from room temperature to 325° F., the joint being maintained under tensile loading for very long periods. The information obtained from a simple short-time laboratory test at room temperature does not permit a proper evaluation of the durability of a joint, hence the need for a "long-time" test at the temperature expected in service.

A joint in copper made with tin-alloy soft solders and maintained at an elevated temperature for a very long time may suffer deterioration of the bond between the copper and solder film. Alloying by diffusion between the tin of the solder and the copper base accounts for this deleterious change. As a result the solder film in the joint loses ductility and the strength of the assembled joint is lowered. It was largely for this reason that it was considered necessary for joints made with tin-base solder to set a temperature which must not be exceeded in service. At temperatures below 250° F., the adverse change in the joint is so slight as to be negligible.

Joints made with the lead-base solders listed were found to have strengths considerably higher at 250° F. and slightly higher at 325° F. than did joints made with (50-50) tin-lead solder. Deterioration of the bond was not observed in lead-base solders free from tin. Of the different lead-base solders used, lead-silver is most practicable from most standpoints. A solder containing lead and silver in the ratio 96:4 is probably the best "all around" soft solder of this class. The technique of its application, however, is not nearly so simple as is the application of common (50-50) tin-lead solder.

Copies of BMS83 are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10¢.

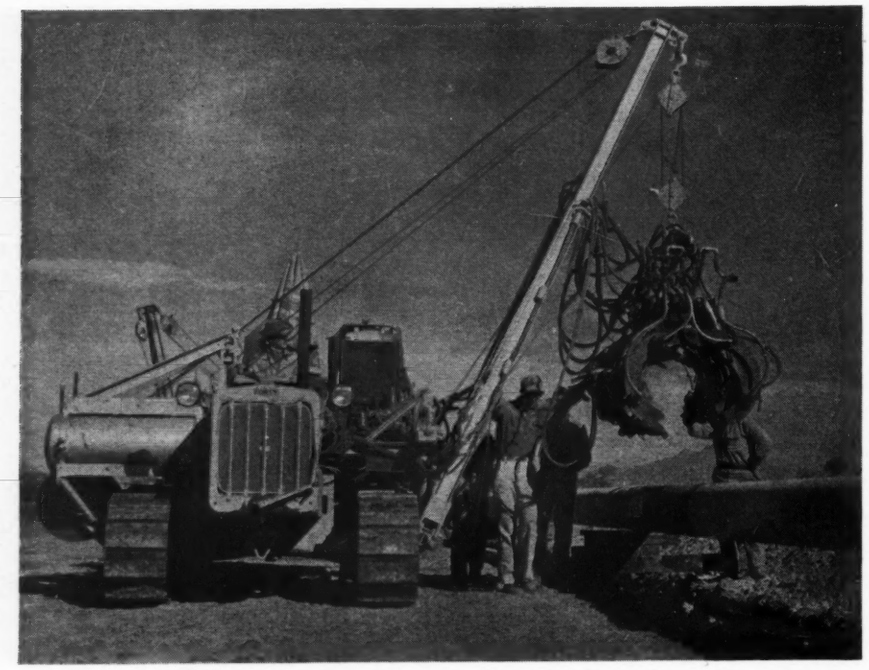


FIG. 1. Welding clamp mounted on a 40 cat, ready for application.

PRESSURE WELDING

A New Method That Speeds Pipe Line Construction

THE Pressure Welding Co., a subsidiary of the El Paso (Texas) Natural gas Co., with officers Paul Kayser, president; C. C. Cragin, vice president and general manager; A. L. Forbes, Jr., vice president and general superintendent; J. E. Franey, secretary and treasurer, and Miss A. C. Martch, assistant secretary and assistant treasurer, has recently been organized and is now doing contract pressure welding of pipe lines.

The "Pressure Weld" is made by using square end pipe; the ends are pressed together and a circular heating head heats the entire circumference of the joint at the same time. As the heat reaches approximately 2200° F, more pressure is applied and the joint welds itself and upsets at the same time. The melting point of the steel is never reached. The fusion is a result of the heat plus the high pressure applied. There is no change in the chemical composition of the steel and the result is a perfectly annealed weld that will out-pull the pipe and will not break on a reverse bend twist.

Over 10,000 ft. of 6⅝-in. pipe were recently laid near Tucson, Ariz., with the "Pressure Weld" method. A crew of six men averaged lining up and welding 20 joints an hour on their first experience with the machine.

The company is now engaged in pressure welding two oil lines for the Texas Co., 38 miles of 10¾-in O. D. from Dallas, Texas, north to McKinney, Texas, and 35 miles of 8⅝-in. O. D. from Sherman, Texas, to Armstrong, Okla. Offices for the Dallas to McKinney job are located in 1814 Magnolia Building, Dallas, Texas, and for the Sherman to Armstrong job, in the Dennison Hotel, Dennison, Texas. The work is under the direct supervision of Mr. Forbes.

The above work consists in welding pipe that was originally laid in 1928. Since the scarcity of oil tankers and the urgent need for pipe line transportation, relocation of the lines became expedient. The pipe was bevelled with oxygen-acetylene bevelling jigs in order to prepare it for pressure welding. The pressure welding clamp is mounted on a 40 cat and requires a crew of three to operate; the cat driver and two clamp operators. (See Fig. 1.) The welding time, in spite of the fact that the pipe line has been underground for over 12 years, approximates a minute to a minute and half per weld. The diameter of the pipe does not affect the welding time, since the number of flames per welding head is either increased or decreased for larger and smaller diameter pipe. The wall thickness of the pipe is the determining factor in the welding time. The pipe on this particular job had a wall thickness of .250 inches. (Figs. 2 and 3 will give somewhat of an idea of the method and process employed.)

The clamp serves as a line-up clamp and eliminates the necessity of tack welding. The clamp is self-aligning and is operated by hydraulic pressure supplied by a hydraulic pump.

The pistons which operate the clamp are clearly shown. The pistons on the end supply the pressure for holding the joint together and upsetting the weld. The pistons on the side supply the pres-

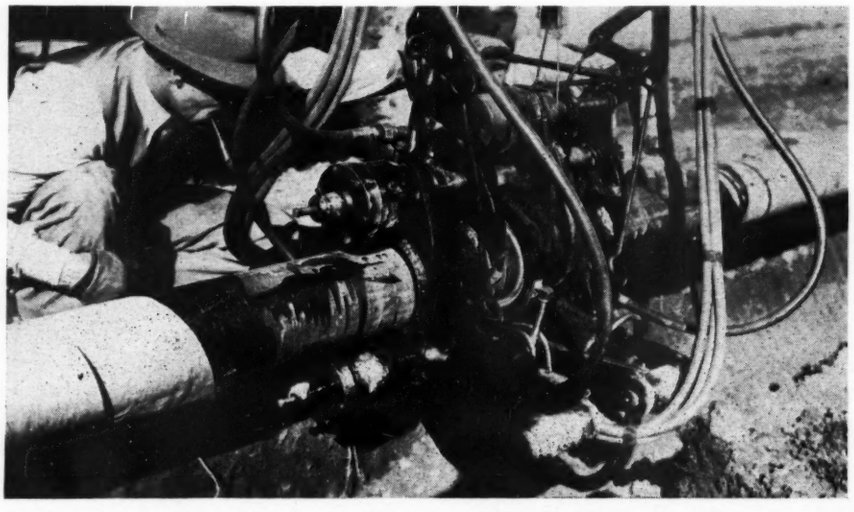


FIG. 2. The welding clamp in place on the pipe line.

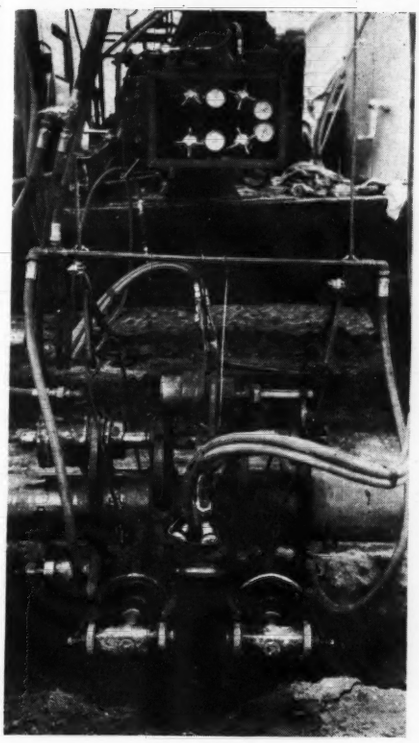


FIG. 3. Another view of the welding clamp in place on the line.

sure for holding the clamp around the pipe and preventing slippage as well as holding the pipe in perfect alignment. The welding flame is seen near the center of the clamp. The hoses shown are oil lines for the pressure pistons, acetylene and oxygen lines for the welding head and water lines to cool the welding head.

A weld on $\frac{3}{16}$-in. wall pipe can be made in 45 seconds and heavier thickness pipe requires a proportionately longer time. The oxygen and acetylene requirements for the pressure weld show a substantial saving over the other types of oxygen-acetylene welding.

■ ■

Public Service Commission Orders Utah Gas Curtailed

Faced with a 96% use of the 5,500,000 cu. ft. of gas it receives daily from its only source of supply for the cities of Provo, Springville, Spanish Fork and other Utah county points, the Mountain Fuel Supply Co., Salt Lake City, Utah, has been granted authority to limit the consumption of gas for domestic, commercial and industrial purposes in these cities by the state Public Service Commission.

If the demand is found to be less than anticipated the regulations may be relaxed somewhat, but as the order stands the provisions are: 1. Connections will not be made at new homes or other domestic places, except for cooking, water heating and refrigeration. 2. New industrial connections will be made with the understanding that gas will be supplied only between March 15 and November 15 each, the off-peak period. 3. Present industrial users will be permitted to use additional gas only during the same period.

Industrial Gas Controls

By ALBERT H. KOCH

Minneapolis-Honeywell Regulator Co., Atlanta, Georgia

GENERALLY speaking, the types of industrial gas controls and their applications for war plant use are about the same as they were previous to war production. On the other hand, the industrial equipment, such as furnaces, retorts, ovens, etc., on which these controls are being used, is being put to entirely new uses in today's war plants. This means that although the war program has produced little change in industrial gas controls, it has changed the requirements of such controls and for that reason this paper will treat the subject with full emphasis on war production, not only because it is the timely thing to do, but because it influences the handling of the subject.

Since the industrial gas control problems of the small plants are fundamentally the same as those of the large plants, only more critical because of lack of experience, and since many of these small plants may now become prospective industrial users of natural gas for the first time, most benefit will be obtained if this subject is considered from the standpoint of the small industrial plant, rather than taking the usual large plant viewpoint.

Broadly speaking, industrial gas controls have been and will continue to be used in industrial plants for one or more of the following reasons: To save fuel, to improve the quality of the product, to insure safe operation, and to increase production. These four benefits have purposely not been named in any special order because their order of importance is different today than it was previous to the war program, and the reasons for this difference are important to the gas company engineer.

Peace-time plant superintendents have said that industrial gas controls were fine for some plants, but in one particular case the gas bill was too small to warrant buying controls to save fuel, the quality of the product was satisfactory (meaning it couldn't be improved or the market did not require better quality), the gas burning equipment was safe because of the precautions they took in its operation, or their production capacity was ample for the business they were doing. In short, a number of industrial users of natural gas were non-users of controls and others considered controls from the standpoint of safety or fuel saving.

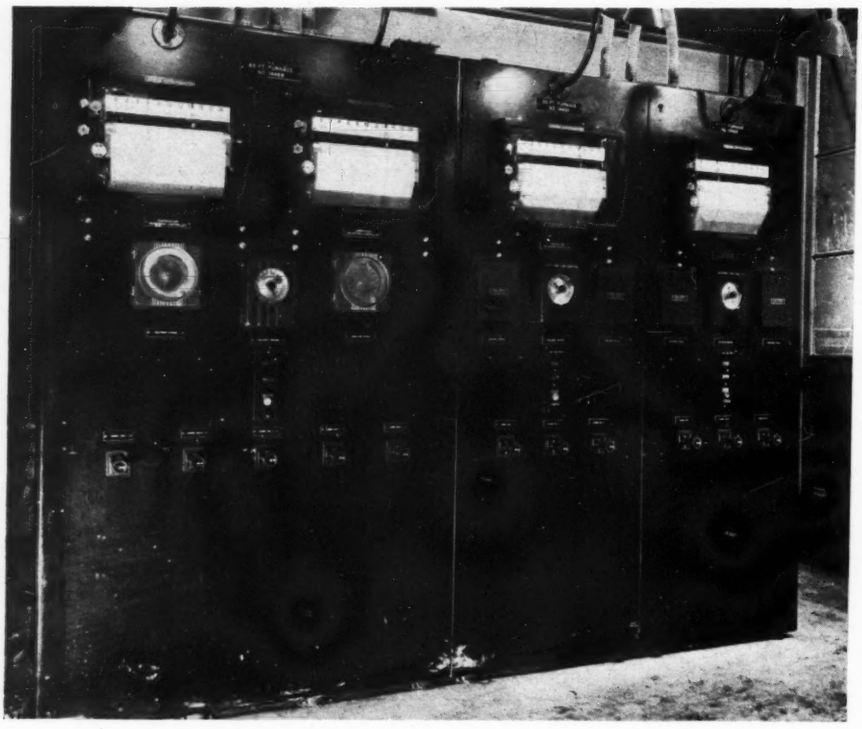
Today these same small manufacturers are taking on or are planning to take on some war production work. In order to successfully engage in war production work they must now take into account all of the following: natural gas must be used efficiently because there is a great demand for this easy to handle, high heat value fuel; war production work must meet rigid government requirements so no compromise is permissible with quality; fuel burning equipment must be made safe to avoid injury to personnel and equipment; and the plant must operate at maximum capacity. Therefore, the many plants that previously could not justify using industrial gas controls will now find it advisable, and in many cases imperative, that they equip their gas burning industrial equipment with suitable controls in order to meet the quality and production requirements of the war program.

What are some of the industrial gas controls that lend themselves to this war production work? First and most important are the various types of temperature control instruments such as potentiometer pyrometers.

The potentiometer type of pyrometer is being used extensively in war production work because the manufacture of armaments requires considerable heat treating and metal working. Temperatures from 200° F. to 3200° F. can be controlled automatically with this type of equipment. Briefly, a com-

A. H. Koch

LAST MONTH Mr. Koch became southern regional manager for the Minneapolis-Honeywell Regulator Co., with headquarters in Atlanta, Ga., being elevated from the post which he previously held as Atlanta branch manager to which he was appointed in May of 1938. During the period 1929 to 1937 he served as industrial sales engineer for the Brown Instrument Division of Minneapolis-Honeywell. A graduate of Stevens Institute of Technology (1926), Mr. Koch is a member of ASME, ASHVE, and the Southern Gas Association. Abstract of a paper, "A Discussion of Industrial Gas Controls as Used in War Plants," presented before the American Gas Association 37th Annual Natural Gas Convention, New Orleans, La., May 4, 5, 6, 7, 1942.



Program control installation for heat treatment of metals.

plete installation consists of only three units—a thermocouple installed in the unit to be controlled, such as a heat-treating furnace, the recording or indicating control potentiometer which is installed remote from the gas burning unit and the control valve which automatically regulates the quantity of gas fed to the burner as determined by the potentiometer controller.

Thermocouples are relatively inexpensive and are furnished in a variety of types and lengths depending on the application. Each particular application pretty much determines the thermocouple specifications; however, extreme care should be exercised when selecting a location for the thermocouple. This is particularly true from a control standpoint because no automatic control equipment can control a variable any better than the measuring system of the control reflects changes in that variable. Very often it is advisable to control a unit, such as a furnace, in zones because either different temperatures are required in different sections of the furnace or the size and construction of the furnace makes it impossible to maintain a uniform temperature throughout when controlling from one thermocouple. Zone control installations need not be complicated because each zone can be handled as an individual control installation.

About the only useful advice that can be given regarding the selection of thermocouple locations is to determine with the aid of the plant personnel, or actual tests, at what point in the process the temperature is most critical, and then select a thermocouple location to measure the temperature at that point, or if that is impossible, at some other point that has a definite relation temperature-wise to the theoretically correct location. This phase of a control installation is stressed here because too often thermocouples are installed where they will fit best instead of where they will perform best.

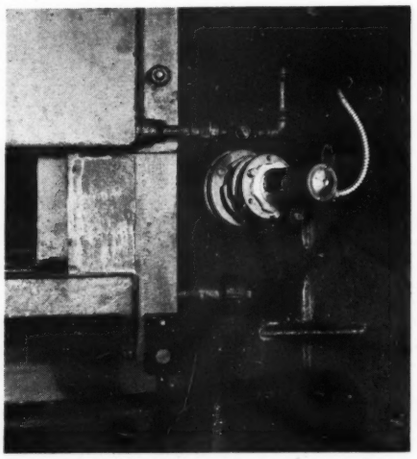
Control potentiometers can be furnished in either the indicating or recording type. The recording type has the definite advantage of giving a continuous and permanent record of the temperature under control, which in war production work is very useful because such a record gives plant management a check on performance even in their absence and also because such a record makes it possible to duplicate past results without loss of time and material.

Control potentiometers can further be furnished with three fundamentally different types of control action: Two-position or "on-off" action, throttling action, and throttling action with automatic reset. Two-position control can be used successfully on batch processes or on continuous processes that have large storage capacities either as fluid volume or as heat content. Although large fluid or heat storage capacities sometimes introduce lags which may be said to be unfavorable to control, the predominant effect of all storage capacity is favorable because it is a balance wheel in its tendency to keep the system in equilibrium.

Most processes that are found in war production work are of the continuous type with rather limited storage capacity, so some form of throttling control action is desirable. The word "throttling" implies that this type of control tends to hold the control valve in a throttled position corresponding to and proportional in its opening to the demands of the system. One possible shortcoming of throttling control is that the control temperatures may drift or "droop" with changes in process load. The degree of "droop" is a functon of both the load change and the width of throttling range adjustment.

Where the characteristics of the system being controlled are such that a throttling controller will "droop," the feature of automatic reset should be incorporated in the controller. This feature is an added or superimposed characteristic and does not affect or change the throttling range adjustment. It begins to operate the instant there is the slightest departure of the temperature from the control point, automatically resetting the gas control valve just enough to supply the required quantity of gas to make up the difference between that required to hold the temperature at the control point and that which would be supplied to hold it at a point other than the control point.

No special discussion of control valves is necessary; however, care should be exercised in selecting a valve with good flow characteristics and of a size suited to the application. It is definitely poor practice to size a gas control valve by making it the same size



Close-up view of radiation sighting tube installed on metal processing furnace.

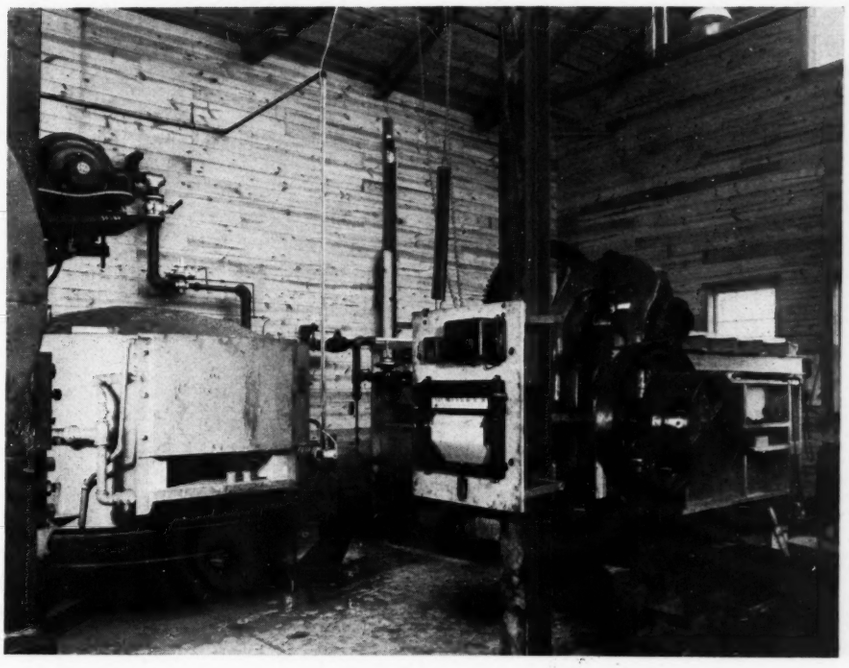
as the gas line because an over-sized valve will make it difficult, and sometimes impossible, to get good control results. Every gas control valve should be sized by actual calculation, taking into account maximum gas flow, gas pressure and pressure drop through the valve.

Gas company engineers can do their customers a worth-while service if they will see that all burners are properly sized for each individual job and that the gas supply to each burner is properly regulated so the gas pressure will remain reasonably constant. This is particularly true in the smaller plants where the control problem is not thoroughly understood and any attempt on the part of the control engineer to get the plant personnel to eliminate such contributing factors to poor control is often just looked upon as merely an excuse and no action is taken. The gas company engineer has the required knowledge and the confidence of the customer to do him a real service along these lines and at the same time make it possible for natural gas to give a good account of itself.

The above types of industrial gas controls in general cover the majority of temperature control applications to be found in war plants. However, there are several refinements that have found rather wide usage in this work because of the rigid standards set up by the government.

One of these is the radiation tube which takes the place of a thermocouple and makes it possible to measure the temperature of the work itself, such as a shell forging, rather than the temperature of the atmosphere surrounding the work as is the case with a thermocouple. This radiation tube consists essentially of a heat-resisting lens, a compensator and a thermopile. The energy radiated from the hot object falls on the lens and is focused on the thermopile which generates an electromotive force proportional to the object's temperature. The compensator corrects for ambient temperature fluctuations surrounding the radiamatic tube, and the potentiometer, therefore, indicates or records true object temperature. It is recommended for those applications where vibration and mechanical shock break the conventional type thermocouples, work moves or rotates, furnace conditions are unfavorable, or temperature is above the thermocouple range of approximately 2900° F. The radiamatic tube can measure temperatures up to 3200° F.

Another refinement is the time-cycle or program control. This type of control system is used where time and temperature are important factors in producing desired results. Stress relieving in the treatment of metals is an excellent example. In such an application, a program control potentiometer will automatically raise, hold or lower temperatures according to a predetermined schedule. This is accomplished by incorporating a timer mechanism with any one of the potentiometer control systems discussed previously. It can readily be appreciated that a control system such as this, which practically eliminates the human element entirely, is of tremendous help to the small plant that is engaged in war work. In fact, of such importance is this refinement in control that the government is requiring that it be used in at least one particular phase of war production work.



Radiation potentiometer pyrometer installation on metal processing furnace.

In addition to these particular industrial gas controls that are finding wider usage in industry as a whole under the war program, there are the thermometer controllers for temperatures up to 800° F., pressure controllers and safety controls. Since these controllers are being used in about the same way in war plants as they were during normal times, and since the average plant personnel has a fair working knowledge of these controls, no detailed discussion will be given here.

From the foregoing it would appear that the average industrial plant engaged in war work has nothing to worry about when it comes to automatic controls for gas-fired equipment. Such might be the case if all equipment, including controls, was correctly specified, installed and operated. However, conditions being what they are, much equipment is now in operation that could be doing a better job. In many instances the user is probably not aware that better performance is possible with resulting improved product and increased production. With access to these plants becoming more and more restricted, it is difficult for equipment manufacturers to know where assistance might be needed. On the other hand, the gas company engineer is usually consulted if any new gas-fired equipment is to be installed and is also given rather free access to the plant after the equipment is operating.

It would appear therefore that the gas company engineer can render his customer a very worth-while service by acting as his engineer, and when advisable, calling in the equipment manufacturers in order to get the best possible service out of every piece of equipment. The average plant engaged in war work is too busy to worry about what appears to be minor details, as long as the wheels are turning and the shipping department is busy. However, the gas companies and equipment manufacturers have something at stake here. These many new industrial users of gas are customers now, but they may only be prospects again when the war is over. Every effort should be made now to see that their gas equipment performs 100% and thereby not only help the war effort but also help to make our future sales job less difficult.

Natural Gas Leads Industry in 1941 Installations

AS IT has for several years, natural gas continued to dominate the domestic gas market as compared to manufactured and mixed gas in 1941 for the four big jobs of cooking, water heating, space heating and refrigeration in practically all types of new residential construction, according to figures released recently by the statistical department of the A. G. A.

Based on reports received from companies representing approximately half of the 18,000,000 meters in service in 1941, the survey shows (see Table No. 1) that natural gas enjoyed a wide margin of preference for space heating in both one and two-family homes and in multiple dwellings, and that it led manufactured and mixed gas in all classifications in one and two-family dwellings. Only in multiple dwellings was natural gas trailing in the actual number of installations for cooking, water heating and refrigeration, but even here on a percentage basis natural gas was ahead except in refrigeration.

Combining the figures for both manufactured and natural gas (Table Nos. 2 and 3), the annual survey revealed that the approximately 200,000 one and two-story family homes constructed in the territory of companies reporting, 89.9% chose gas for cooking, 77.7% use gas water heating, 58.7% installed gas house heating, and 11.1% selected gas refrigeration.

Gas proved even more popular for cooking and refrigeration in the study of multiple dwelling houses but did not show up quite so well for the other two services of the four big jobs, since manufactured gas slumped badly as a choice for water heating and space heating in this building classification.

Summarizing the combined figures on multiple dwellings, gas cooking was the choice in 94.5% of the dwelling units, gas water heating, 54.8%, gas house heating, 32.2%, and gas refrigeration, 17.8%.

Inaugurated several years ago by the Residential Section as a service to the gas industry, this tabulation of the use of gas services and appliances will be continued annually.

TABLE NO. 1. Comparison of natural gas installations with manufactured and mixed gas installations for cooking, water heating, refrigeration and space heating in new homes and multiple dwellings constructed during 1941 along the gas lines of companies reporting figures to the A. G. A. annual survey prepared by the Residential Section.*

	New Homes Along Mains	Cooking	Water Heating	Refrigeration	House Heating
Per Cent in One and Two-Family Homes					
Natural Gas	118,226	92.7%	92.9%	12.6%	87.2%
Manufactured and mixed gases	80,240	85.8%	55.2%	9.0%	16.6%
Natural gas	+37,986	+ 6.9%	+37.7%	+ 3.6%	+70.6%
Per Cent in Multiple Dwellings					
Natural gas	31,575	96.2%	96.5%	7.9%	73.6%
Manufactured and mixed gas	43,790	93.2%	24.8%	25.0%	2.4%
Natural gas	—12,215	+ 3.0%	+71.7%	—17.1%	+71.2%
Actual Installations in One and Two-Family Homes					
Natural gas	118,226	109,607	109,891	14,842	103,128
Manufactured and mixed gas	80,240	68,838	44,301	7,202	13,320
Natural gas	+37,986	+40,769	+65,590	+ 7,640	+89,808
Actual Installations in Multiple Dwellings					
Natural gas	31,575	30,386	30,465	2,483	23,232
Manufactured and mixed gas	43,790	40,825	10,865	10,949	1,050
Natural gas	—12,215	—10,439	+19,600	— 8,466	+12,182

*Computed by *GAS* staff from figures contained in A. G. A. statistical department report of annual survey conducted by the Residential Section.

TABLE NO. 2. GAS SERVICE AND GAS APPLIANCES USED IN ONE AND TWO-FAMILY HOMES CONSTRUCTED DURING 1941*

Gas	New Homes Along Gas Lines	Cooking	Per Cent	Water Heating	Per Cent	Refrigeration	Per Cent	House Heating	Per Cent
Natural	118,226	109,607	92.7	109,891	92.9	14,842	12.6	103,128	87.2
Manufactured and mixed	80,240	68,838	85.8	44,301	55.2	7,202	9.0	13,320	16.6
TOTAL	198,466	178,445	89.9	154,192	77.7	22,044	11.1	116,448	58.7

*As reported by gas companies representing 10,535,191 meters divided as follows: Natural, 3,510,366; manufactured and mixed, 7,024,825.

TABLE NO. 3. GAS SERVICE AND GAS APPLIANCES USED IN UNITS OF MULTIPLE DWELLINGS CONSTRUCTED DURING 1941*

Gas	Dwelling Units in Multiple Dwellings Along Lines	Cooking	Per Cent	Water Heating	Per Cent	Refrigeration	Cent Per	House Heating	Per Cent
Natural	31,575	30,386	96.2	30,465	96.5	2,483	7.9	23,232	73.6
Manufactured and mixed	43,790	40,825	93.2	10,865	24.8	10,949	25.0	1,050	2.4
TOTAL	75,365	71,211	94.5	41,330	54.8	13,432	17.8	24,282	32.2

*As reported by gas companies representing 8,639,372 meters divided as follows: Natural, 3,105,506; manufactured and mixed, 5,533,866.

FPC Suspends United Fuel Proposed Rate Increases

The Federal Power Commission announced September 4 an order (a) suspending a rate schedule submitted to the Commission by the United Fuel Gas Co., Charleston, W. Va., which would increase rates for natural gas sold to the Louisville Gas & Electric Co., Louisville, Ky., and (b) setting public hearing on the matter for November 9, 1942, in the Commission's hearing room in Washington.

The order follows the company's failure to submit information required to justify the increased rate, as required by the Commission's rules and regulations under the Natural Gas Act on the ground that compliance with the rules would require an amount of work out of all proportion with the business involved. The order of September 4 suspends the rate schedule "until February 2, 1943, or until such time thereafter as said schedule shall be made effective in the manner prescribed by the Natural Gas Act," and provides that interested State commissions may participate in the hearing.

Rate Reduction Proposed by Natural Gas Pipeline Co.

The Federal Power Commission recently announced the filing of proposed schedules by the Natural Gas Pipeline Co. of America, Chicago, Ill., that would reduce rates to its utility customers in Illinois, Iowa, Kansas and Nebraska by approximately $2,738,000 annually. This proposed reduction, when added to the commission's "interim" rate order of July 23, 1940, upheld by the Supreme Court, which reduced the pipe line company's wholesale rates $3,770,000 annually, would save the company's utility consumers approximately $6,500,000 per year.

Natural Gas Proceedings Available at A. G. A. Offices

The 1942 Natural Gas Proceedings are now available at the American Gas Association, 420 Lexington Ave., New York City, and orders are being filled promptly. There are 257 pages of both a general and a technical nature bearing directly on the problems of the natural gas industry.

Simplifying the Sizing for Gas Furnaces

THE INSTITUTE of Gas Heating Industries in Los Angeles under its managing director, F. O. Suffron, has taken a long forward step in creating a procedure which will enable gas-fired heating equipment salesmen to easily and properly size house heating equipment. In years past purchasers of such equipment in the Southern California territory have been confused by the varying suggestions made by representatives of gas heating equipment manufacturers. The plan worked out and herewith described centers about a Heating Survey and Calculating Sheet, which lists and organizes all the factors in heating equipment installation. Not only does the use of this procedure simplify the salesman's job, but it also creates in the mind of the customer a conviction that his heating problem will be properly solved. The Institute of Gas Heating Industries was formed several years ago and is supported by dealers in the Southern California area. Mr. Suffron became managing director in 1940.

EVER since people began to use gas for heating homes in Southern California, the problem of getting salesmen of gas heating appliances to provide them of adequate size has been both major and unsolved. Many times confusion was created in the minds of people who were merely trying to ascertain what equipment to purchase to heat their homes adequately. The confusion resulted because prices and specifications quoted by different concerns varied so widely that many times they did not know what to buy.

Many solutions to this problem were suggested; some were tried, with varying degrees of success. Not until the Institute of Gas Heating Industries, working in cooperation with the City of Los Angeles authorities, undertook to solve the problem did any great degree of success become apparent. Even now no guarantee can be given, but certainly it has been made easy for salesmen of heating equipment to do the right kind of a job.

The Institute realized that the first thing to do was to provide a method of calculating heat losses or heat inputs to appliances which would eliminate the necessity for salesmen to master involved mathematical calculations. This has been accomplished, and the basis for the method and the description of how it works is as follows:

In order to complete the simplified sizing plan, a simplified method for sizing warm air ducts and warm air registers must be included. The solution to this part of the problem is well on the way of being solved, and will be in use in the near future.

This simplified method of calculating heat inputs to gas warm air furnaces was designed by making certain assumptions based on experience. These assumptions were judged to be sound by a committee from the Institue of Gas Heating Industries. It is recognized that no simplified or average method of determining heat losses or heat inputs will be absolutely accurate for all cases. It is believed that the results obtained by using this method will be well within reasonable limits of the results obtained by accepted, more complex methods. Any unusual conditions found in buildings, or any building which is out of the ordinary, must be studied by a recognized heating engineer regardless of the method used for determining heat losses. The following assumptions have been made:

1. Appliance efficiency—70%.
2. Duct efficiency—83%.
3. Number of air changes per hour—4.
4. 100% fresh air.
5. Temperature difference.

Types of construction most common to the Southern California area have been classified and the average transmission coefficients for each one have been determined by use of data contained in the American Society for Heating and Ventilating Engineers' Guide. From these data it was possible to determine input factors for each type of construction contained in the method. These input factors were derived as shown in the following sample calculation:

The coefficient for windows, doors, and skylights is 1.1 B.t.u. per square foot per degree Fahrenheit; therefore, the input factor for each square foot area of windows, doors, or skylights is calculated by the following formula:

$$\text{Input Factor} = \frac{\text{1.1 B.t.u. per sq. ft. per deg. F} \times 40^\circ \text{ F temp. rise}}{\text{70\% appliance efficiency} \times \text{83\% duct efficiency}} = \text{77 B.t.u. per hr. furnace input per sq. ft. surface}$$

The transmission coefficients selected, and the corresponding input factors, are shown in Table No. 1.

After these input factors were derived, the mathematical calculations for all areas involved, including leakage, were performed and printed on a series of six charts. These charts provide data for: (A) Exposed walls; (B) Ceilings and floors of single story buildings; (B1) Floors, second story of two-story building; (B2) Ceilings, lower rooms of two-story building; (C) Doors and

TABLE NO. 1. B.T.U. INPUTS PER SQUARE FOOT OF EXPOSED AREA
Simplified Furnace Sizing Method for Gravity and Forced Air Gas Furnaces

	Type	Coefficient	Input Factor
Wall Construction			
Windows, Doors, Skylights	1H	1.1*	77
Stucco, paper, studs (studs exposed)	1H	1.1	77
Stucco, paper, studs, lath and plaster	2H	0.398	26
Stucco, paper sheathing, studs, lath and plaster	3H	0.3145	22
Wood siding, paper, studs, lath and plaster	3H	0.3145	22
Wood shingles or shakes, strips, studs, lath and plaster	3H	0.3145	22
8-in. brick, furred, lath and plaster	3H	0.3145	22
Brick veneer, paper sheathing, studs, lath and plaster	4H	0.2495	17
Wood siding or shingles, paper sheathing, studs, lath and plaster	4H	0.2495	17
Roof Construction			
Asphalt or rigid asbestos shingles, composition, slate or tile roofing on wood sheathing and no ceiling (rafters exposed)	1H	1.1	77
Wood shingles on wood strips, no ceiling (rafters exposed)	1H	1.1	77
Wood, asphalt or rigid asbestos shingles, composition, slate or tile roofing on wood sheathing or strips with lath and plaster ceiling	2H	0.398	26
Floor Construction			
Double floor over vented space	7H	0.13	9
Floor resting on ground	7H	0.13	9
Leakage			2.9

Input factors were determined by selection of a fixed appliance and duct efficiency, selection of specified number of air changes per hour, 100% fresh air and a fixed temperature difference.

*Glass loss determined by use of additive figure to exposed walls.

HEATING SURVEY AND CALCULATION SHEET

NAME _____ ADDRESS _____

SPACE TO BE HEATED _____

TYPE OF APPLIANCE: GRAVITY FURNACE ☐ FORCED AIR FURNACE ☐

CONSTRUCTION	TYPE	CHART
EXPOSED WALLS		A
CEILING AND FLOOR		B
DOORS AND WINDOWS	1 H	C
CUBICAL CONTENTS - - - -	- - - - - -	- - D

PROCEDURE

STEP 1. FILL IN NAME, ADDRESS, ETC.
STEP 2. DETERMINE AND NOTE TYPE OF CONSTRUCTION.
STEP 3. DETERMINE ALL MEASUREMENTS FOR SPACE TO BE HEATED.
STEP 4. READ ALL CHARTS AND ADD BTU INPUT FIGURES.
STEP 5. RECOMMEND NEAREST LARGER SIZED FURNACE.

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			
	SUB-TOTAL			

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			
	SUB-TOTAL			

ROOM NO.	EXPOSED WALLS	LENGTH	CEILING HEIGHT	BTU INPUT
	CHART A	1. 2. 3.		
	CEILING FLOOR CHART B	LENGTH	WIDTH	BTU INPUT
	DOORS WINDOWS	HEIGHT	WIDTH	BTU INPUT
	CHART C	1. 2. 3. 4. 5. 6.		
	CUBICAL CONTENTS	LGHT.	WIDTH	HGHT. / BTU INPUT
	CHART D			
	TOTAL BTU INPUT INTO ROOM			
	SUB-TOTAL			
	GRAND TOTAL			

FOR TWO-STORY HOUSES:
USE CHART B-1 FOR FLOOR LOSS—1ST FLOOR.
USE CHART B-2 FOR CEILING LOSS—2ND FLOOR.

RECOMMENDATION: SIZE _____ M. BTU.
FIRM NAME _____
SALESMAN _____ DATE _____

REMARKS _____

windows; (D) Cubical contents of rooms.

Charts A to C, inclusive, furnish a figure already calculated, for any size room, of the B.t.u. input required to offset heat loss based on 40° F. temperature difference between indoors and outdoors. Chart D gives a figure, for a room of any cubic content, of the B.t.u. input required to maintain the temperature of the air in the room at 70° F., with outside temperature 30° F., through four air changes per hour.

This makes it unnecessary in 99% of the cases for the person making up job specifications to perform any multiplication. It is merely necessary to pick figures off the charts and enter them on the Heating Survey and Calculation Sheet shown as Fig. 1. A pad of these sheets, which has the transmission coefficients and input factors printed on the front cover, and the charts inserted in an envelope attached to the back cover, comprises the heating survey "kit".

An examination of the Heating Survey and Calculation Sheet will show that space has been provided for six rooms, or sufficient space to take care of the normal three-bedroom home. It is hoped and recommended that the Heating Survey and Calculation Sheet will be used as a sales tool as well as a means for determining factual data. All persons like to feel that equipment which they are purchasing has been designed especially to fulfill their particular needs. It is therefore recommended that no part of the Sheet be neglected, and further that the procedure outlined in the square on the upper right-hand corner of the Sheet be followed. This is recommended because it makes the entire procedure which is necessary to arrive at a proper furnace size simpler than if a person jumps from one part of the procedure to the other. In this manner, all measurements can be made at the same time and all charts can be read at the same time, thus leaving simple addition to be performed in order to arrive at the correct size.

These heating kits are available to persons engaged in the heating business in Southern California through the Institute of Gas Heating Industries. The reason that the distribution is restricted to Southern California is because the data were designed for weather conditions experienced in that area. Obviously, similar data could be developed for any other area. The method has been inaugurated by the Institute of Gas Heating Industries in the interests of better and more adequate sizing of gas heating equipment.

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Government Agencies Urge Insulation of Private Homes

Details of the Government's campaign to encourage home insulation as a necessary fuel conservation measure were discussed by Wharton Clay, secretary of the National Mineral Wool Association, over the radio recently. Mr. Clay said that the removal of credit restrictions announced in July was the first of a series of official steps designed to foster insulation.

A Government booklet, "How to Heat Your Home With Less Fuel," has now been issued under the joint sponsorship of the Office of War Information, OPA, OPC, and WPB. Theme of the booklet is the urgency of applying insulation and other recommended means to forestall the effects of a fuel shortage this winter.

According to Mr. Clay, home insulation is a good idea at any time, because it cuts fuel consumption as much as 40%. In wartime, insulation is doubly important. Bureau of Mines figures indicate a billion dollars a year is wasted in heat escaping from uninsulated houses.

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Philadelphia Gas Rate Cut To Half Original Increase

Meeting strong opposition from the public, the press and the government, the Philadelphia Gas Commission has cut the original rate increase granted in Philadelphia by half. The new rate will add about 8½¢ to a $2.00 monthly bill instead of 17¢ under the original proposal. The increase has been granted to compensate for the sharply increased price in the cost of bunker C oil used in processing gas. On August 1, the OPA reduced the price of bunker C oil by 15¢ a barrel, and the consequent saving of approximately $350,000 annually made the cut in the rate increase possible.

■ ■

Wisconsin Public Service Publishes Annual Report

A 16-page booklet containing numerous pictures, tables, charts and a map of the territory served by the company has been issued by the Wisconsin Public Service Corp. in its "Annual Report to Stockholders for 1941," according to Dale Remington, advertising manager.

Servel's Nutrition Program for War Industries

A NATIONWIDE "Nutrition in Industry" program for war workers which gas utility companies may make available to war plants in their communities, and which will enable such plants to help speed the nation's War Production Drive, has been developed by Servel, Inc., in support of the Government's drive for manpower conservation through industrial nutrition.

The plan has been so set up that gas companies may present it to war plants in their communities through their local Government Nutrition Committee. Gas companies can begin the program immediately by contacting their local Nutrition Committee and setting up an organization structure. The various promotional and educational material has been prepared with this approach in mind. Slogan of the program, featured in poster and pamphlet educational materials is: "EAT TO BEAT THE DEVIL!"

The principal steps involved in putting the "Nutrition in Industry" plan into effect entails enlisting the cooperation and *action* of: (1) the war plant management; (2) the war workers in those plants; (3) the plant cafeteria; (4) the plant neighborhood restaurants; (5) wives of war workers.

1. *Enlisting Cooperation of War Plant:* A presentation portfolio, entitled "Nutrition in Industry," which describes the complete program, is used by a gas company representative to convince the war plant management of the need for such a program in their plant. A pamphlet, "Operating Guide to Nutrition," which shows the plant management how to put the plan into effect immediately, is among the portfolio material. With approval obtained, the various services of the local gas company, most especially those of their trained home economists, in the home service department, will help the war

How the Servel
Nutrition In Industry Plan
can help break the lost-time bottleneck in your War Plant
DEPT. • 232
NO LOST TIME THIS MONTH
90% of absenteeism is caused by ILLNESS... not ACCIDENTS
PROPER NUTRITION CAN MEAN:
★ Fewer days lost
★ Increased production
★ Fewer rejects
★ Better safety record
Here's how Gas Companies are ready to help
1
HELP TELL YOUR WAR WORKERS WHAT FOODS TO EAT AND WHY
2
COOPERATE WITH YOUR CAFETERIA STAFF
3
ENCOURAGE NEIGHBORHOOD RESTAURANTS TO SERVE NUTRITIOUS FOODS
4
SHOW WORKERS' WIVES HOW TO PACK BETTER LUNCHES
Home Volunteer
AND—IN OVER 430 CITIES, GAS COMPANIES OFFER WORKERS' WIVES HELP IN SERVING THE RIGHT FOODS AT HOME
NUTRITION IN INDUSTRY
WAR PLANT EXECUTIVES: YOUR GAS COMPANY HAS COMPLETE DETAILS OF THE PLAN
SERVEL, INC.

Servel Backs Nutrition Program With National Advertising Campaign

A national advertising campaign in leading weeklies and business publications as well as women's magazines, having a combined circulation of more than 35,000,000, is giving further, powerful impetus to the advance interest and editorial backing already accorded the "Nutrition in Industry" Plan which Servel, Inc., of Evansville, Ind., has developed for war industries everywhere through the gas utilities to help speed the war production drive. Objectives of the campaign are three-fold:

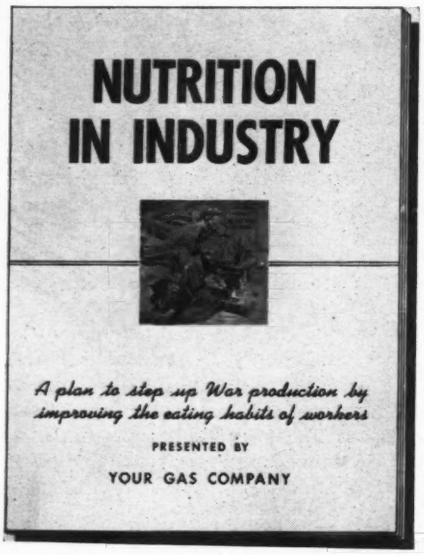
1. To tell the war plant executive about the "Nutrition in Industry" Plan and how it will help to break the lost-time bottleneck in his war plant.

2. To tell wives and mothers of war workers about the plan and how they can contribute to it.

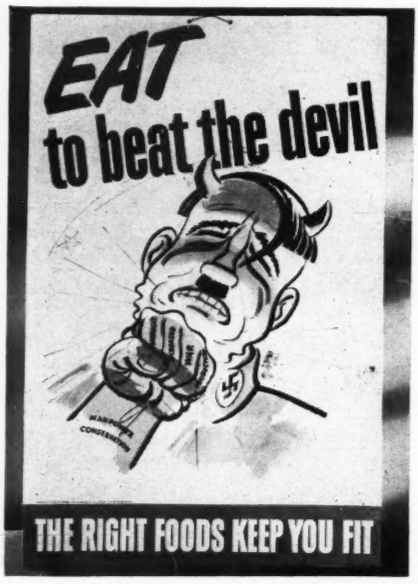
3. To tell "customers" of the gas industry the job which the industry is doing and the wartime service it is rendering through the "Nutrition in Industry" plan which has been developed in support of the government's industrial nutrition campaign recently announced, and which is a program for keeping war workers healthy and on the job by guiding their eating in the plant cafeteria, the plant neighborhood restaurants, the home packed lunch brought to the plant, and at home.

The drive for better eating habits in war plants will receive editorial support from writers on food and nutrition in the United States, many of whom visited the Servel plant and cafeteria in Evansville recently and saw for themselves the actual operation of the "Nutrition in Industry" Plan as it is carried on by Servel for the employees in its own factory, now converted to 100% war production.

The first ad in the national advertising campaign on the "Nutrition in Industry" Plan, appearing during September and October, is directed to the war plant executive. The double-spread copy tells what the "Nutrition in Industry" Plan is and how it will help reduce absenteeism in the war plant—emphasizing the part played by the local gas company in helping the war plant to successfully operate the plan.


NUTRITION
IN INDUSTRY
A plan to step up War production by improving the eating habits of workers
PRESENTED BY
YOUR GAS COMPANY

Cover design of booklet which gas company representatives may present to war industry executives in explaining the importance and functions of the "Nutrition in Industry" program.



Theme of the Industrial Nutrition program is carried on this poster to be used to educate the war worker on the need for a balanced, healthful diet.

plant put the plan into operation.

2. *Enlisting Cooperation of War Workers:* In order to educate the workers to the basic rules of correct nutrition, the gas company will help the war plant to put on an educational campaign with health posters, folders, publicity stories in the plant paper, buttons, etc., all keyed to the fighting theme, "EAT TO BEAT THE DEVIL!"

3. *Enlisting Cooperation of Plant Cafeteria:* Whether or not the plant has a nutritionist, the gas company home economist can help the plant cafeteria manager and chef plan low-cost, balanced meals which conform with the recommendations of Government nutrition food rules. She also can recommend daily "Victory Plate Lunches" — a low-cost, balanced meal based on government nutrition recommendations.

4. *Enlisting Cooperation of Plant Neighborhood Restaurants:* A gas company representative will assist the war plant in forming a special committee to contact restaurants, lunch rooms and cafeterias in the vicinity of the plant and secure their cooperation in providing balanced meals for workers.

5. *Enlisting Cooperation of Wives of War Workers:* Emphasis will be on helping wives, mothers and housekeepers of war workers pack nutritious *lunch boxes* for the war workers in their families, and to prepare balanced, healthful meals for them at home that supplement those eaten on the job. For this purpose, a Nutrition Guide Book with the title "Eat to Beat the Devil" has been prepared. For further information, workers' wives or mothers are invited to visit their gas company for materials and guidance in planning home meals.

Servel's action on the "Nutrition in Industry" problem started four months ago when it launched a series of nutrition experiments with the families of typical workers in its plant, at the suggestion of the Office of Defense Health and Welfare Service. These followed the recommendations set forth in the National Nutrition Program, and included menus and meal planning suggestions prepared by the company's Home Service Department.

These studies revealed that the home-packed lunch and the mid-shift meal were especially important. As a result, many changes have been made in these lunches and the food served in the plant cafeteria. Out of these experiments, a broad gauge, food-for-health program has been initiated for Servel employees.

The gas company provides an ideal channel through whom needed assistance can be given the nation's war industries in solving the industrial nutrition problem, and the accompanying problem of absenteeism.

The gas companies have been doing food and nutrition work for years, giving advice and aid to millions of workers' wives throughout America in the planning, preservation and cooking of foods that keep us fit. They can provide the trained home economists and nutritionists, the demonstration rooms, the kitchens and the appliances needed in the effective operation of such an industrial nutrition program.

A large number of gas companies already are active in the wartime nutrition field. Many have taken steps to affiliate with the National Nutrition Program of the Government, either through the Red Cross, or their local Defense Councils. Other gas companies are now doing purely volunteer work in nutrition among organized groups and general consumers.

Servel, which long ago discovered that nutrition went hand-in-hand with war production and has since pioneered many developments to improve the eating habits of its thousands of employees, has been working with and interested in the food and nutrition problem for years; naturally so, since it has been working with food problems for the past 15 years, in connection with the scientific manufacture of the gas refrigerator.

■ ■

West Virginia U. Dedicates Mineral Industries Building

As a fitting tribute to the opening of the institution's 76th academic year, West Virginia University will dedicate on Oct. 16-17 its new million-dollar mineral industries building.

Begun in 1940, the building embodies factors which make it the fulfillment of the dreams of the scientist, engineer, teacher, and student. It houses the school of mines, the West Virginia geological survey, the department of geology, and the department of chemical, metallurgical, and ceramic engineering.

The oil and gas laboratories have specialized equipment for analyzing both petroleum and natural gas by fractional distillation—a process through which is measured the content of such hydrocarbons as butane — raw material for synthetic rubber — ethane, methane, propane in natural gas and petroleum.

■ ■

Defense Is Subject of Davis DeBard K. C. Talk

At the invitation of the Kansas City Gas Co., Kansas City, Mo., Davis M. DeBard, vice president of Stone & Webster Service Co., New York City, and an authority on civilian defense measures, appeared recently before 12,000 people in Kansas City, of whom 8000 were civilian defense trainees, to discuss "Civilian Defense in England."

The occasion was the graduation of the civilian defense trainees from their training course, and Mr. DeBard was the principal speaker on a 3½-hour program.

■ ■

New Leaflet in Series Explains Appliance Care

"Chart for Equipment Care," new leaflet in the Victory Library series published by *McCall's Magazine,* tells women how to get maximum service from household appliances. McCall's Victory Library is a series of leaflets to help women adjust home life to wartime conditions, and particularly to help them live up to the United States Government's consumer's pledge: "As a consumer . . . I will buy carefully; I will take good care of the things I have. I will waste nothing."

W. G. Russell, GAS Field Representative, Resigns

W. G. RUSSELL, field representative for *GAS* and *Butane-Propane News*, resigned his position September 15 because of advancing age and ill health. Mr. Russell who is 76 years of age had been active until the day of his retirement. He became affiliated with Western Business Papers, Inc., in 1925 shortly after the founding of *Western Gas*, which has been published as *GAS* since May, 1936.

W. G. Russell

Mr. Russell was born in New York City and has been active in the newspaper and publication fields throughout the major part of his career. His early experience in circulation work was gained on the metropolitan papers in New York City. Prior to his affiliation with Western Business Papers, he served as representative for a number of oil journals.

As field representative with Western Business Papers, Mr. Russell traveled extensively throughout the middlewest and eastern states. With a wide acquaintance in the industry and a fund of knowledge on the natural gas industry, he was frequently called upon to address employee meetings of natural gas utility companies and civic bodies. His career in publication work was interrupted briefly in 1928 when he installed the gas service in Haskell, Texas, where he now lives in retirement.

■ ■

Revised Protection Manual Now Available From A. G. A.

With more than 60 pages of new information added to the American Gas Association's book, "War Production of the Gas Industry," the second issue of that publication was distributed to the industry in August.

Originally containing 100 pages, 8½x11 in. in size, with numerous illustrations, the manual was first published last spring in looseleaf form so that it could be brought up to date from time to time.

Already widely recognized as the most authoritative publication available on the war protection of the gas industry, this book tells how to prepare gas plants and other facilities against enemy attack. It also outlines procedures to repair damages resulting from actual attack. The background includes the published literature of American, English, German and other foreign sources, communications from observers on the war scene, and the latest experimental work carried out by American gas companies.

Copies are available from the American Gas Association, 420 Lexington Ave., New York, N. Y., at a price of $2.50 to A. G. A. members and $5 to non-members. The first cost includes all subsequent and revised material.

■ ■

Electric Projects Curtailed To Conserve War Materials

WPB has ordered work to cease on projects to produce 2,000,000 kilowatts of electric energy because of "the necessity for diverting critical materials and equipment to the direct war program." There are to be total stoppages, or delays, of power plants under construction, lower priorities or none at all for some plants, and higher priorities for others which are considered essential, but which cannot be named because of their military importance.

Manufacturers Win "E" Awards

Worthington

THE Navy "E" for excellence in production was recently awarded to the Worthington Pump & Machinery Corp.'s works in Harrison, N. J., in recognition of its outstanding performance in building machinery and equipment used on American naval vessels. With Rear Admiral Wiley making the presentation speech and Hobart C. Ramsey, vice president, making the acceptance speech, before Harry C. Beaver, president, and 5000 spectators, the colorful ceremonies in the Harrison works were the climax of a day of visiting at the plant by a number of naval notables.

Among those personally congratulated on their fine work by Navy representatives were four of the men who built, a number of years ago, the Worthington pumps that kept the cruiser Marblehead afloat as it made its spec-three months voyage home for repairs after being badly damaged in battle. These men were: Thomas Morrison, David Gray, Anton Berge and Alfred Carlin.

Minneapolis-Honeywell

Winning the Army-Navy "E" excellence in the production of a wide range of precision instruments, including sighting equipment for the Navy and controls and gun sights for the Army, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., "produced far in excess of what we in the Army had anticipated," according to Brigadier General Armstrong, who made the presentation of the award.

Accepting the award were Harold W. Sweatt, president of the company, and Svenung H. Skogvold and Inga T. Erickson, the two oldest employees of the company, who represented the men and women workers whose technical skill and manual dexterity made possible the production record.

In his speech, President Sweatt said: . . . "To me this award is not so much a banner of achievement but rather it is a very definite challenge to each and every one of us."

Although primarily engaged in war production, Minneapolis-Honeywell is continuing to make a limited number of its peacetime controls for use in government and defense-housing projects, and is manufacturing parts for controls already in civilian service.

President George C. Purdy of Greenlee Bros. & Co., Rockford, Ill., receives the Army-Navy "E" Flag from Lieut. Col. Edward H. Bowman, chief of Chicago Procurement District.

Greenlee

GREENLEE BROS. & CO., of which Greenlee Tool Co. is a division, was presented the Army-Navy "E" Flag on Thursday, September 3, on the company grounds in Rockford, Ill. Presentation of the flag to George C. Purdy, president of the company, was made by Lieut. Col. Edward H. Bowman, chief of Chicago Procurement District. Lieut. Commander R. J. Twyman spoke for the Navy and presented employee representatives with "E" pins.

This ceremony was witnessed by over 3000 people, including employees, members of their families, and honored guests. Among the latter were Brig. Gen. John M. Willis, commander of Camp Grant, and his staff; representatives of the Chicago Ordnance District and the War Production Board; also city and county officials.

Among the products manufactured by Greenlee Bros. & Co. and Greenlee Tool Co. are transfer machines for machining airplane engine parts, automatic screw machines for making munitions, wood-working machines for use in shipyards and airplane plants.

Governor Harold E. Stassen of Minnesota is shown speaking on behalf of the people of the North Star state at the presentation of the joint Army-Navy production award to the Minneapolis-Honeywell Regulator Co., the first joint Army-Navy "E" award in the Midwest. Left to right: H. W. Sweatt, president of Minneapolis-Honeywell; Brig. Gen. Donald Armstrong, chief of the Chicago Ordnance District; Lyman E. Wakefield, president of the First National Bank and Trust Co., Minneapolis, and Governor Stassen.

ASSOCIATIONS

P.C.G.A. Plans "Specialists Meetings" for 1943

ESSENTIAL business only was the order of the day at the Pacific Coast Gas Association's miniature meeting, held September 4 at the St. Francis Hotel in San Francisco. Tall in stature and short in speech, P. C. G. A. President R. S. Fuller, Pacific Gas and Electric Co., brought the 80-odd delegates to sudden order and the meeting was on its way.

In his address President Fuller regretted that the usual well attended and fruitful P. C. G. A. Convention had had to give away before the exacting demands of war, but found some compensation in the fact that the gas utility members of the Association were achieving a splendid record in supplying the fuel needs of war industries. While it was not possible for as many people to spend as much time on Association work as had been the case in former years, it was found that the Association's war time program developed many useful ideas and accomplished much important work through the more intense participation of fewer members in conference meetings held throughout the year.

Following the presidential address the Association's section chairmen were summoned to the roster to give their reports. Those reporting included L. W. Coughlan, chairman, Accounting Section; J. E. Kern, chairman, Sales and Advertising Section; F. F. Doyle, incoming chairman, Technical Section (Mr. Doyle substituted for Technical Section Chairman H. P. George); E. L. Payne, chairman, Manufacturers Section; and Dorothy Henriksen, chairman, Women's Committee. (See *GAS*, Sept., 1942, p. 29-60.)

The morning General Session was closed ahead of schedule and the delegates reassembled at a cocktail party given by the Manufacturers Section. Following the cocktail hour, the Association's board of directors and section chairmen, the Women's Committee, and the Manufacturers Section held luncheon meetings.

Elections

The September issue of *GAS*, page 29, carried the full roster of those nominated for the Association's offices for the coming year. Those nominated were elected without a hitch. F. M. Banks, vice president, Southern California Gas Co., became president; E. L. Payne, vice president and general manager, Payne Furnace and Supply Co., vice president; and D. G. Martin, general auditor, Pacific Gas and Electric Co., was reelected treasurer. Heading the Manufacturers Section as general chairman will be A. H. Sutton, Mission Water Heater Co. E. T. Howard of General Controls Co. will be vice chairman.

Association Section chairmen for the coming year will be: P. W. Walters (Accounting); R. J. Phillips (Sales and Advertising); F. F. Doyle (Technical); A. C. Joy (Cooperative Advertising Committee); and Gladys Warren (Women's Committee).

Plans for 1942

Continuing and enlarging upon the war time meeting schedule followed in 1942, the Board of Directors authorized President Banks to call such meetings in 1943 as may be appropriate. Since it is likely that general section conferences will not be possible, a plan calling for a number of specialists meetings was developed by Managing Director Clifford Johnstone. These specialists meetings will be called by section chairmen, and invitations will be issued to member companies to send at least one particularly qualified representative to the meeting.

Each specialized subject will be sponsored and it will be the sponsor's duty to prepare an agenda for his meeting to be forwarded through the section chairman to interested executives in member companies. It is suggested further that each company hold a symposium of its own based on the agenda prior to the specialists meeting. The sponsor will then act as chairman of his particular meeting, arranging to have notes taken and minutes prepared for distribution to interested parties. It will be the sponsor's duty also to remain active throughout the year, directing inter-company contacts on his subjects as may be appropriate. The schedule of specialists meetings for 1943 is shown in Table No. 1.

At the directors' meeting a resolution was passed to the effect that all members in good standing at the time of entering service be continued as members with full privileges without further payment of dues until the close

TABLE NO. 1. SCHEDULE OF PACIFIC COAST GAS ASSOCIATION'S 1943 SPECIALISTS' MEETINGS

Subject	*Place*	*Date*	*Sponsor*
Accounting Section			
Payroll Accounting	Santa Cruz	Nov. 5-6	Not Selected
Commercial Problems	San Francisco	Jan. 21-22	Harry McGann
Clearing Accounts	San Diego	Mar. 11-12	Not Selected
Executive Problems	Los Angeles	May 5-6	P. W. Walters
Sales and Advertising Section			
Commercial and Industrial Sales	Los Angeles	Oct. 15-16	Frank Foster
Dealer Activities	San Francisco	Dec. 11	B. W. Reynolds
Home Service	Los Angeles	Feb. 18-19	Katherine Rathbone
Domestic Promotion	Santa Cruz	Apr. 8-9	H. W. Edmund
Executive Group	Portland	June 24-25	R. J. Phillips
Technical Section			
Production	San Francisco	Oct. 22-23	Frank Wills
Utilization	San Francisco	Nov. 19-20	E. C. Drew
Maintenance	Los Angeles	Mar. 18-19	Elting Henderson
Transportation	San Diego	Apr. 22-23	C. D. Weiss
Measurement	Los Angeles	May 20-21	H. A. Faull

The Gas Camera at the P. C. G. A. Convention

• TOP: P. C. G. A. President R. S. Fuller, Pacific Gas & Electric Co., San Francisco; Gladys Warren, San Diego Gas & Electric Co.; P. C. G. A. President-Elect F. M. Banks, Southern California Gas Co., Los Angeles; Dorothy Henriksen, Pacific Gas & Electric Co., Fresno.

• CENTER: A. R. Bailey, Coast Counties Gas & Electric Co., San Francisco; E. G. Arnedt and L. W. Coughlan, Pacific Gas & Electric Co., San Francisco; Joe Sauer, Pacific Gas & Electric Co., San Rafael.

• BELOW: J .E. Kern, Southern California Gas Co., Los Angeles, greets E. J. Hinchey, James Graham Manufacturing Co., San Francisco, as R. J. Phillips, San Diego Gas & Electric Co., looks on.

• TOP: J. H. Lewis, Grayson Heat Control, Ltd., Lynwood; H. W. Edmund, Coast Counties Gas & Electric Co., Santa Cruz; E. L. Payne, Payne Furnace & Supply Co., Beverly Hills (P. C. G. A. vice president-elect); K. C. Tomlinson, American Meter Co., San Francisco.

• CENTER: F. A. Hough, Southern Counties Gas Co., Los Angeles, takes time out from convention activities to discuss wartime distribution topics with D. H. Perkins, San Diego Gas & Electric Co.

• BELOW: H. L. Farrar, Coast Counties Gas & Electric Co., San Francisco; C. A. Swigart, Pacific Coast Gas Association, Los Angeles; E. H. Coe, Central Arizona Light & Power Co., Phoenix, Ariz.

of the fiscal year next following their return to the industry or the cessation of hostilities, whichever comes first. Dues for member manufacturing companies were set and then waived for the coming year.

Awards

Chairman H. W. Edmund presented the Report of the Awards Committee at the General Session, and the Association's honors went to the following:

Gold Medal award to Messrs. P. E. Beckman, J. J. Pugh and E. G. Arnedt, all of Pacific Gas and Electric Co., for their paper entitled, "Forecasting Winter Day Load in a Natural Gas Territory." This paper was given Honorable Mention last year with the recommendation that it be subjected to further study. This award is the result of a review of its value in the past year.

Honorable Mention is given to the paper by Messrs. A. S. Leonard and L. M. K. Boelter of the University of California, entitled "Effect of Inert Diluents on Combustion."

Honorable Mention is given to the paper by P. W. McDonald of Southern California Gas Co. entitled, "The Development of a Procedure for Testing Flue Cowls."

Basford Trophy: This trophy was awarded to the Accounting Section, L. W. Coughlan, chairman, for setting an outstanding example in establishing a new precedent for the improvement of inter-company contacts. The procedure under which the Accounting Section operated during the past year was described by Mr. Coughlan in a statement published in the September issue of *GAS*, page 55.

Women's Committee: Chairman Dorothy Henriksen announced that the San Joaquin Power Division of Pacific Gas and Electric Co. had been awarded First Prize in the Year Book Contest, with the San Diego Gas and Electric Co. a close second.

First Prize in the Essay Contest, "Public Utility Women in Defense," was won by Jackie Ludwig, San Joaquin Power Division, Pacific Gas and Electric Co., and Second, third and fourth prizes were as follows: Mary Schnieder, San Diego Gas and Electric Co.; Marjorie Leach, Southern Counties Gas Co.; Georgia Morton, San Diego Gas and Electric Co.

■ ■

C. N. G. A. Meeting Discusses Recovery Equipment Topic

At the September 3 meeting of the California Natural Gasoline Association in Downey, Calif., the speakers emphasized the practical and engineering factors bearing on the use of existing natural gas plant equipment to manufacture isobutane for 100 octane aviation gasoline and the building of new gas plant equipment for the recovery of propane.

The titles of the papers read and the authors follow: "Using Existing Gasoline Plant Equipment for Maximum Isobutane Recovery," by Glenn H. Hile, gas engineer, Standard Oil Co. of California, and "Design of the New Gasoline Plant Equipment for Recovery of Propane," by Henry N. Wade, president, Parkhill-Wade, Los Angeles.

■ ■

Defense Against Air Raids Will Be S. C. M. A. Topic

W. M. Henderson, superintendent of distribution, Southern California Gas Co., Los Angeles, will headline the October 15 meeting of the Southern California Meter Association to be held at the Rio Hondo Country Club. His topic, "Defense Against Air Raids," will be a description of means and equipment developed for controlling escaping gas and extinguishing gas fires resulting from air raids. Some of the equipment and methods developed by Mr. Henderson are described in an article, "Emergency Fire Control and Shut-off Methods," published in *GAS*, September, 1942, page 39.

Virgil E. Schultz, Los Angeles branch manager of The Foxboro Co., will supplement the profgram with a discourse, "Automatic Controllers—Their Fundamental Design and Application." Mr. Schultz will discuss the selection and application of three types of controllers: the on-off, throttling and automatic reset.

Some 60 members turned out for the September meeting to hear B. G. Williams present a history of orifice meter development. An open forum on allied topics offered by J. T. Cortelyou, Southern California Gas Co.; H. P. Saueressig, Texas Co.; C. B. Heartwell, Standard Oil of California, and J. B. Taylor, Jr., Signal Oil & Gas Co., rounded out the program.

■ ■

Cost of Living Met by Raise

To equalize salaries under $300 a month to meet the rising cost of living, the Southern California Gas Co. and the Southern Counties Gas Co., Los Angeles, Calif., have announced a $10 a month raise for all employees in this classification effective Aug. 16.

CONVENTION CALENDAR

October

American Gas Association Annual Meeting—LaSalle Hotel, Chicago, Ill., Oct. 5-6.

American Society of Mechanical Engineers—Rochester, N. Y., Oct. 12-14.

American Institute of Mining and Metallurgical Engineers, Petroleum Division—Ambassador Hotel, Los Angeles, Calif., Oct. 15-16.

National Safety Congress—Chicago, Ill., Oct. 27-29.

November

National Chemical Exposition and National Industrial Chemical Conference—Sherman Hotel, Chicago, Ill., Nov. 24-29.

National Industrial Council—Waldorf-Astoria Hotel, New York, N. Y., Nov. 30-Dec. 1.

American Society of Mechanical Engineers Annual Meeting—New York, N. Y., Nov. 30-Dec. 4.

A.I.M.E. Los Angeles Meeting To Discuss Oil-Gas Recovery

STRESSING the study of modern recovery methods and factors affecting the most efficient production of oil and gas, the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, Southern California Section, will hold its annual two-day session at the Ambassador Hotel, Los Angeles, Calif., October 15 and 16. Papers presented will be mostly directed toward the latest technical procedures and practices for increasing recovery from natural gas and oil reserves.

Lieut. Commander Harry P. Stolz, chairman of the national Petroleum Division of the Institute, will call the first meeting together for its program of technical papers in the Ambassador theater the afternoon of October 15. This program of papers and discussions to be presented by engineers of the Petroleum Division will be open to the public.

For the evening of October 16, a dinner is planned for members of the Institute at which the local section will be hosts to the Petroleum Engineering Division.

The program of technical papers which are of unusual significance at this time has been drawn up by E. G. Trostel, assisted by Lawrence E. Porter, Howard C. Pyle, Prof. John F. Dodge, John E. Sherborne, James T. Carriell, Robert B. Moran, Ralph M. Marshall and H. K. Armstrong.

Chairmen of the various committees in charge are as follows: C. P. Watson, chairman Southern California Section, A. I. M. E.; Lieut. Comm. Harry P. Stolz, chairman Petroleum Division, A. I. M. E.; E. G. Trostel, associate chairman, Papers and Program Committee; George W. Nilsson and Leigh M. Battson, Committee on Arrangements and Entertainment; Dwight Whiting, Clarence J. Coberly, Finance Committee; Walker S. Clute, publicity chairman, and Walter Abel, secretary and treasurer.

■ ■

American Chemical Society Annual Meeting Nov. 24-29

Sponsored by the Chicago Section, American Chemical Society, and regarded as an important contribution of the chemical industry to the war-time effort, the National Chemical Exposition will be held November 24 to 29 at the Hotel Sherman in Chicago with an expected attendance of approximately 20,000 from all sections of the country, including research chemists, executives of industrial plants, engineers, purchasing agents, government specialists and others.

■ ■

Annual Meeting of API Scheduled for Nov. 9-13

The 23rd annual meeting of the American Petroleum Institute will be held in Chicago, November 9-13 at the Palmer House instead of the Stevens Hotel as originally scheduled, according to William R. Boyd, Jr.

The Stevens Hotel is not now available because of occupancy by the Army Air Corps.

■ ■

National Safety Congress To Hold Chicago Meeting

Because the Government has taken over for military purposes the Stevens and Congress Hotels in Chicago, the 31st National Safety Congress and Exposition will be held at the Sherman, LaSalle and Morrison Hotels on October 27-29.

Convention headquarters will be in the Sherman.

REMINDING YOUR POST-WAR CUSTOMERS:

The Everdur* that is today helping the fight for victory in a host of vital uses, is not being forgotten in its peace time forms. Four-color advertisements like this one, appearing in Time magazine with over 1,000,000 circulation, are constantly reminding your future merchandise customers of the advantages of rust-proof, durable Everdur tanks in water storage heaters. 4230A

*Reg. U. S. Pat. Off.

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from mine to consumer

Anaconda Copper & Brass

THE AMERICAN BRASS COMPANY—General Offices: Waterbury, Connecticut

Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

THE WAR--
Topic for Discussion at A.G.A. Meeting

DEVOTED strictly to the consideration of war and post-war problems of the gas industry, the 24th annual meeting of the American Gas Association at the La Salle Hotel, Chicago, Ill., Monday and Tuesday, October 5-6, will be brief but significant. No attempt will be made to examine routine operating problems that are not directly related to the winning of the war and to the building of a firm basis upon which to make future peace-time readjustments. There will be no entertainment.

The general program outlined for the two-day session will occupy every minute of the convention's time. The entire first day, Monday, will be taken over by the sectional meetings, starting with the Natural Gas Section meeting in the morning and continuing during the luncheon period, afternoon and possibly evening, with meetings of the Accounting, Industrial and Commercial, Residential and Technical groups.

Broad general problems of industry-wide scope and significance will be dealt with at the general sessions which will take place the entire second day.

The framework of the program was prepared with two thoughts paramount: (1) How best can the gas industry contribute more effectively to the war effort? (2) What can we do now to prepare for the tremendous upheavals of post-war readjustment? These two themes will be developed by outstanding speakers.

Speaking before the general sessions, the chairman of the Committee on War Activities will present the record of the gas industry's major contributions to the war program and recommend a course of action for further cooperation to aid this program. The general sessions will also include the presidential address, election of officers, report of treasurer, and other necessary business matters. A feature of this program will be the presentation of awards for distinguished service to the gas industry.

Sectional programs will spotlight specific operating problems and wartime solutions. In general their plans follow:

Natural Gas Section: Following the brief business meeting to elect new officers and receive committee reports, it is now planned to devote the entire program Monday morning, October 5, to a symposium on materials and priorities led by J. French Robinson, chairman of the OPC Coordinating Committees and chairman of OPC District No. 1. Chairmen of the other district committees will participate in the symposium. The War Production Board will be represented with several speakers who will discuss problems incident to obtaining materials and priorities in connection with the transmission and distribution of natural gas. Representatives from the Office of Petroleum Coordinator for War will handle similar problems having to do with materials for production.

Accounting Section: Accounting Section Committees will conduct a group of open meetings on Monday, October 5, for discussion of problems arising from labor and material shortages, bimonthly and quarterly meter reading and billing plans, priorities accounting, insurance depreciation, taxation accounting and other war emergencies.

Industrial and Commercial Gas Section: The Monday afternoon meeting will consist of an open meeting of the Managing Committee of the Section. This meeting will be devoted to problems which have arisen in connection with the use of gas in war production plants and in other activities directly related to the war effort. Opportunity will be provided to all in attendance to ask questions on specific subjects in which they are interested. All gas men and equipment manufacturers attending the annual meeting are invited to be present at this session.

Residential Section: Subjects to be discussed from the platform and in round table fashion Monday afternoon, October 5, are Maintaining Customer Contacts for the Duration, Domestic Gas Research, the Industrial Nutrition Program and Planning for Post-War Sales. The home service breakfast will be held Tuesday morning, October 6, preceding general sessions.

Technical Section: At its meeting on Monday, October 5, the Technical Section necessarily will take many of its reports and papers as read, so as to enable the time available to be utilized to maximum possible advantage for consideration of the many activities on the part of Technical Section Committees and its members which relate directly to the war activities of both the industry and the country. While all are important, among the more outstanding are the subjects of tin content of solder, the use of oil and possible substitutes in the production of carburetted water gas, the operation of motor vehicles under wartime restrictions for both gasoline and rubber, and the research studies of the section on organic sulphur in gas and pipe coatings and corrosion.

Natural Gas Section Program

The following is an outline of the natural gas meeting to be held on Monday morning, October 5, in the LaSalle Hotel, Chicago, Ill., at the time of the annual meeting of the American Gas Association. The meeting will start promptly at 9:30 o'clock.

1. Observations by:

George S. Hawley, president, American Gas Association; president, Bridgeport Gas Light Co., Bridgeport, Conn.

Major Alexander Forward, managing director, American Gas Association.

A. F. Bridge, president-elect, American Gas Association; vice president and general manager, Southern Counties Gas Co., Los Angeles, Calif.

2. Symposium: War Requirements in the Natural Gas Districts

Leader: J. French Robinson, chairman, OPC District No. 1; chairman, Natural Gas Section, American Gas Association; president, The East Ohio Gas Co., Cleveland, Ohio.

Burt R. Bay, chairman, OPC District No. 2; vice chairman, Natural Gas Section, American Gas Association; president, Northern Natural Gas Co., Omaha, Neb.

N. C. McGowen, chairman, OPC District No. 3; president, United Gas Pipe Line Co., Shreveport, La.

R. W. Hendee, chairman, OPC District No. 4; general manager, Colorado Interstate Gas Co., Colorado Springs, Colo.

William Moeller, Jr., chairman, OPC District No. 5; vice president, Southern California Gas Co., Los Angeles, Calif.

Discussion.

3. WPB Orders and Their Application to the Natural Gas Industry

(Speaker from War Production Board.)

Discussion.

4. OPC Orders and Their Application to the Natural Gas Industry

E. Holley Poe, director, Natural Gas and Natural Gasoline Division, Office of Petroleum Coordinator, Washington, D. C.

Discussion.

5. Business Meeting.

THE WAR IS OVER! VICTORY IS OURS!

What if this heading had appeared on the newspaper you saw this morning? How would you feel? A real celebration would be in order, wouldn't it?

Even the thought makes us realize how much more we must do to help speed the day that will bring this headline.

(J42-10) October "Victory Is Ahead" Display (GB42-10) "Tea Cup and Cards" Displays

Color Scheme: Orange, magenta, light blue, gray, dark brown, and white.

A variation of this theme has been applied to the "Victory Is Ahead" and "Tea Cup and Cards" Utility Displays illustrated here. They will make everyone want to work harder and resolve not to let up; they explain how Business Managed Utility Companies are doing their share to help bring the day of Victory closer. They're a must for every utility office.

(J42-9) September Jumbo Gas Display GB42-9) Sept. Gas Background Displays

Color Scheme: Light blue, yellow, maroon, dark blue. Photo-illustrations in black gravure.

JUMBO DISPLAYS

Size 29½"x 42", on heavy seasoned cardboard, double-faced with same display on both sides (giving two showings) and with 40" column Stand for standing.

BACKGROUND DISPLAYS

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1 to 3	$5.10 each
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BISHOP PUBLISHING COMPANY • 155 East Superior Street • Chicago, Illinois

Natural Gas Arrives in Pontiac, Mich.

NATURAL gas arrived in Pontiac, Mich., on August 31, and the task of changing over this important center of wartime production is now under way, according to a news story appearing in the *Consumers Power News*, published by Consumers Power Co., Jackson, Mich., which serves the territory.

The changeover in Pontiac is being made in two steps: (1) gas burners are being adjusted to accommodate a mixture of natural and manufactured gas; (2) the burners will be adjusted for 100% natural gas. The job is expected to be completed during the first half of October. Before the year is out, according to present plans, changeovers will be made in Consumers' Jackson, Battle Creek and Kalamazoo divisions. Changeover operations in Flint were completed about August 1.

All changeover operations to date have been carried on with natural gas from Michigan fields. But a connecting link in the pipe line bringing natural gas from the Texas Panhandle is approaching completion, and eventually the major portion of the gas burned in the Pontiac division will be Texas gas.

Pipe Lines Constructed

Panhandle Eastern Pipe Line Co., Kansas City, Mo., began construction last month on the 85-mi. 12-in. line from Jackson to Kalamazoo that will be a link in the project, of which the Pontiac changeover is a part, that was planned more than a year ago to bring natural gas to the major cities in Michigan through a system of lines totaling approximately 250 mi.

Construction on this section has been contracted for by Midwestern Engineering & Construction Co., which has established a field office in Jackson. Although it was originally planned to use 16-in. pipe on the line, the steel shortage forced the use of 12-in. pipe which is now being delivered.

The laying of 150 mi. of pipe that was begun earlier in the year by I. C. Little and H. C. Price for Panhandle Eastern for a main line running north and south to connect Pontiac and Saginaw is virtually completed. The pipe sizes on this part of the main project varied from 12-in. to 20-in.

Altogether there are some 39,000 gas meters in the Flint division and 4300 in the Owosso division. These serve approximately 105,000 appliances of all kinds, including varying makes of kitchen ranges, refrigerators, water heaters, burners, torches and special industrial equipment. In addition to the thousands of domestic and commercial users of gas there are also in this territory large industrial consumers such as Fisher Body, Buick and Chevrolet.

Two methods of changeover were used. There were certain areas of 5000 meters or less which could conveniently be isolated, straight natural gas being immediately supplied with service crews completing all adjustments within three or four days. This resulted in a minimum of inconvenience to customers.

Such subdivision was impractical in a large district, containing 22,000 meters, in the heart of Flint. Here a mixed gas changeover was made in two steps —the first to 800 B. t. u.'s and the second from 800 to approximately 1000 B. t. u.

All the territory in the two divisions was divided into nine areas, natural gas being turned on in one after another as the work progressed. After several weeks of preparation the new fuel was supplied to the first area on May 25. Work in the ninth and final unit was completed about August 1.

Before starting operations, a field crew of 280 men had been selected and trained in a special school under actual working conditions. Standard tool kits were provided, and thousands of detailed spare parts and fittings made ready in stock bins. Natural gas was piped to the work room under line pressure for practical shop experience with the new fuel on all kinds of appliances.

Meanwhile an office group was also under instruction in a carefully planned system of crew operation and customer contacts. Even though all customers had been notified in advance by telephone, there were a comparative few who did not understand, or who became impatient at the brief and unavoidable interruption of service.

The "customers' men" on these phones — all high school teachers — were chosen largely on qualifications of patient courtesy and the ability to explain temporary conditions in a way satisfactory to users.

Changeover operations in the Flint and Owosso divisions were under the direction of D. E. Herringshaw, general gas engineer, and Cletus J. Farrell, changeover supervisor.

■ ■

SEC Approves Property Sale

Approval has been given to the Northern Natural Gas Co., Omaha, Neb., by the SEC for the proposed sale of its subsidiary's property, Peoples Natural Gas Co., to Northern States Power Co., a Minnesota corporation. The cash consideration was $1.00.

Lone Star Adds Facilities To Meet Winter Peak Loads

DESIGNED to increase the gas transmission system's capacity to meet winter peak loads, the Lone Star Gas Co., Dallas, Texas, is completing the laying of several new lines and the adding of nine Cooper-Bessemer compressor units at a new station east of Waco, Texas. They will handle a total of 40,000,000 cu. ft. of gas at full capacity.

The new lines include those recently built, now building and shortly to be completed. One is a new line from Durant, Okla., to the Cumberland field where connection will be made with Warren Petroleum Corp.'s new natural gasoline plant, 16 miles northwest of Durant, is still under construction. This new 8-in. line starts at a point south of Community Natural Gas Co.'s measuring station south of Durant and will connect with the main line which has previously served Bryan County towns. The Cumberland project was started early in August. Approximately 150 men have been engaged on the construction job under the direction of R. Vandercook, Lone Star pipe line superintendent, and Luther Tolbert, assistant pipe line superintendent and construction supervisor.

Eight miles of welded 6-in. line have been completed in the vicinity of San Angelo, Texas, linking an air field southwest of that city with the company's transmission system.

Eleven miles of 4-in. from Purcell to Lexington, Texas, will be completed this month.

■ ■

Application Filed With FPC For 18-Mile Interconnection

The Federal Power Commission held a public hearing in September on applications recently filed by The Ohio Fuel Gas Co., Columbus, Ohio, and Panhandle Eastern Pipe Line Co., Kansas City, Mo., requesting issuance of a certificate of public convenience and necessity to construct and operate an interconnection of approximately 18 miles of 20-in. pipe between the Ohio Fuel Co.'s 16-in. line and the 22-in. line of Panhandle's wholly-owned subsidiary, Michigan Gas Transmission Corp., Detroit, Mich., near Toledo, Ohio.

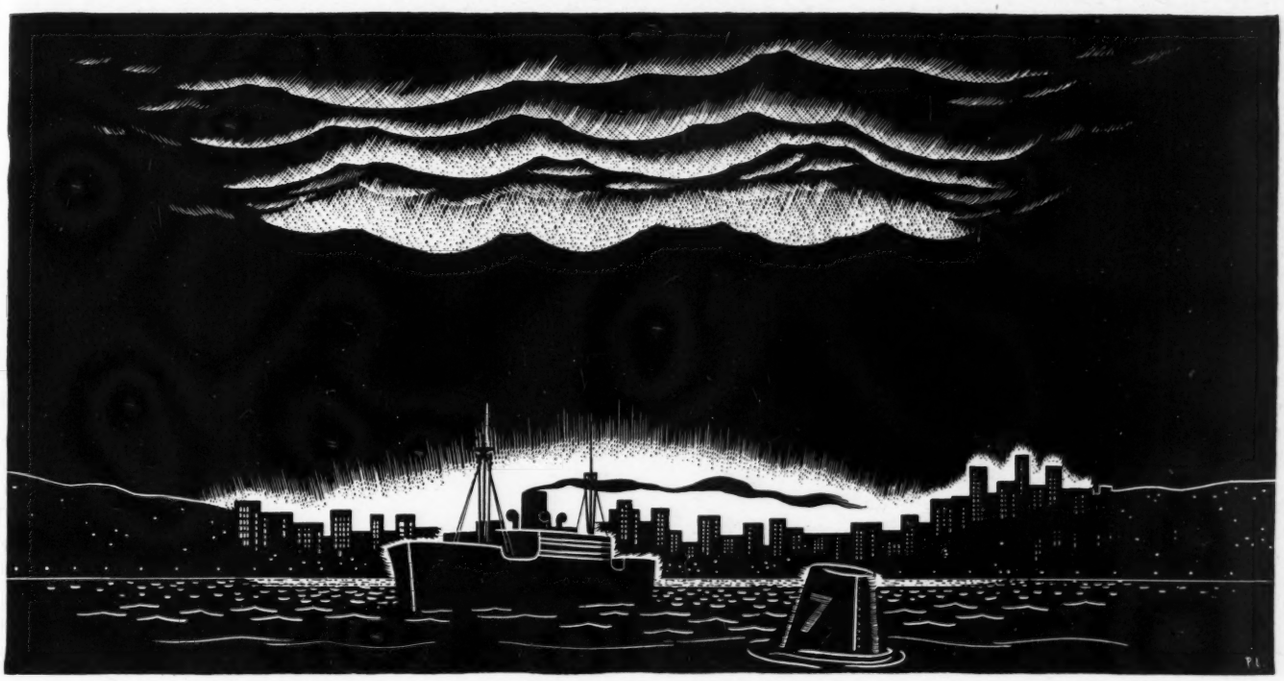
The applications contained copies of a letter dated July 24, 1942, from J. A. Krug, chief, Power Branch, War Production Board, addressed jointly to the applicants, stating that the interconnection is essential in order to assure adequate supplies of gas to the war industries in the region served by the Ohio Fuel Co. Both companies have filed applications with the War Production Board for priority assistance in obtaining the necessary pipe for the interconnection, the construction and ownership of which will be determined in the proceedings before the Commission.

■ ■

Community Natural Builds New Line for Army Field

The Community Natural Gas Co., Dallas, Tex., has started construction on a 6-in. pipe line to run to the San Angelo Army Flying School Number 2, according to announcement by E. L. Buelow, superintendent of the San Angelo Division of Community Natural Gas Company. He said construction of the line should be finished within 10 days or two weeks, as the construction crew can lay a mile of line a day. Potential consumption of the new field is unknown because it has never been announced how many men and facilities will be placed thereon.

However, San Angelo's Goodfellow Field's normal consumption is about 3 to 4 million cu. ft. of gas monthly, and the new field will be larger than Goodfellow.



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PACIFIC GAS AND ELECTRIC COMPANY

Lone Star Prepares for Winter Peaks

A NATURAL gas supply sufficient to meet unprecedented peak demands on Lone Star Gas Co., Dallas, Texas, industrial and domestic lines for the coming winter will be assured with completion of construction work now under way by Lone Star engineering and pipe line departments. Seven new pipe line projects completed or nearing completion throughout the system and a new compressor station being constructed in the Waco area, are part of the huge-scale program which will call for even further line construction before the winter season reaches its peak.

The new compressor plant is located east of Waco on the north bank of the Brazos River where Lone Star's 16-in. line L crosses. It will facilitate service in that area and will operate nine Cooper compressor engines of 170 h. p. and will handle a peak load of around 40,000,000 cu. ft. of gas. Plant construction is under the supervision of A. B. Hemphill, assistant engineer. M. W. Crowder is district compressor engineer.

Eleven and seven-tenths miles of new pipe line supplementing the 3-in. and 4-in. line to McGregor has been completed and ties into line L at Lorena. The new line is an 8-in., and was completed August 21.

Still under construction is a new line from Durant to Cumberland field in Oklahoma which will tie into the Warren Petroleum Co.'s natural gasoline plant 16 mi. northwest of Durant. The 8-in. line starts at a point south of Community Natural Gas Co.'s measuring station south of Durant and will connect with the main line which has previously been serving Bryan County towns. It will augment the present supply of gas.

The Cumberland project was begun early in August. Approximately 150 men have been working on it under the supervision of R. Vandercook, Lone Star pipe line superintendent, and Luther Tolbert, assistant pipe line superintendent and construction supervisor for all pipe line construction for the company. J. N. Carpenter is district pipe line foreman in the Durant area.

At San Angelo, the pipe line department has just completed a 6-in. high pressure line to an air field southwest of town. The all-welded line is 8 mi. long and was completed in seven days, despite the necessity of crossing Lake Nasworthy at a point 2000 ft. wide. The workmen used a raft to float the completed line across the lake, using a truck and winch attachment to pull the raft. Pipe Line Foreman Herman Dempsey worked with Mr. Tolbert in completing this line.

In Temple District work begun May 31 on 25½ mi. of 10-in. line was completed June 24. A new line from Waco to China Spring was another completed project, tied into line L July 12.

Line L-31 from Taylor Junction through Round Rock in the Georgetown District is serving industrial users in this area, being completed May 5. Part of this same project was the 11 mi. of 12-in. line from Waco to Riesel paralleling second line L-8 and completed May 22. Eldon Glenn, Waco District pipe line foreman, assisted with construction supervision in both Georgetown and Temple projects.

Eleven mi. of 4-in. line will be laid from Purcell to Lexington and will be completed some time in September. Mark Black is district pipe line foreman on this work.

Assisting Mr. Tolbert on all of the pipe line construction are Earl Miller, construction foreman, and Aubrie Boyd, district foreman from Cayuga. Welding foreman is Vernon Lackey.

■ ■

Northern Natural Gas Co. Pipe Line System Expanded

Northern Natural Gas Co., Omaha, Neb., has received authorization from the Federal Power Commission to construct approximately 31.4 miles of 20-in. and 24-in. pipe to loop the company's existing natural gas line in the state of Kansas, and to install three compressor units totaling 3100 h. p. in compressing stations in Kansas and Nebraska. Work on the new facilities is to be started by November 1, 1942.

The company has on hand the necessary equipment and material for the compressing installations, and part of the pipe. The War Production Board has granted the company certain preference ratings for the pipe and material needed to complete the loop lines.

The temporary certificate specifically provides that construction shall commence on or before November 1, 1942, and be completed on or before June 1, 1943, unless the time is extended by Commission order; that progress on the construction and installation shall be reported periodically to the Commission.

■ ■

Oklahoma Helium Found

Discovery of helium in two southwest Oklahoma gas fields may result in the construction of a helium plant in those areas.

The gas was found in the Cement field of Grady and Caddo counties and in the Carter-Stephens county field. Although the helium content of the gas is not as high as in the Amarillo, Texas, area, it is high enough to interest the government. New funds that have been appropriated for an additional helium plant may be used to extract the gas from the new field.

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Six-Point Guide Assists Home Owners To Conserve Domestic Space Heating Fuels

A six-point guide to wartime domestic fuel conservation, making possible savings up to 50% at little or no cost to the home owner, was announced recently by J. W. Pauling, vice president of the Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Following six simple, time-tested rules householders can maintain comfortable, healthful temperatures this winter with a considerably lowered fuel consumption and at the same time aid the war effort by lessening the demand on all fuel transportation agencies, according to Pauling, who is a member of the Plumbing and Heating Manufacturers Industry Advisory Committee of the War Production Board.

The six basic points, drawn from the company's experience since 1885, are:

1. Prevent overheating and maintain uniform temperatures. Keep daytime temperatures to an even 68° and turn the thermostat down to 50° at night.
2. Turn off heat in unoccupied rooms (this includes bedrooms during the day). Keep shades drawn and keep windows closed at night.
3. Do not waste hot water.
4. Install storm windows and repair or close openings around doors and windows to effect complete insulation.
5. Replace missing boiler or furnace insulation. Insulate the hot water heater.
6. If in doubt, call your dealer and check your heating plant.

Tests conducted in all types of dwellings in all parts of the country and under all weather conditions reveal the merit of these rules. Following them will materially cut domestic heating bills and help the nation avert a serious fuel shortage.

The temperatures of over 70° so common in American homes are actually dangerous to health as medical surveys show that at these temperatures, children are more subject to colds and other nose and throat infections. In one test adults in a 75° room did 15% less work than at a temperature of 68°. This is because overheating hurries the pulse, lowers the blood pressure and weakens the action of the heart and blood vessels. If the temperature is held at a uniform level, normal persons are more comfortable at a lower temperature than they would be if the degree of heat fluctuated widely.

Tests by Minneapolis-Honeywell and the National Association of Building Owners and Managers show that each degree the temperature is raised above 70° results in a 3% increase in fuel use.

■ ■

Unusual Jap Map Posters Spur Wisconsin Sale of War Bonds to Employees

A novel War Bond drive progress map has helped the Wisconsin Public Service Corporation put employes in the 10% Club. With 1250 men and women involved, the drive to pledge 10% of the payroll took less than 10 days to complete. Vacations and the scattered area involved extended the length of time somewhat as over 88% participation and 9.5% deduction had been accomplished in the first five days.

All departments received a copy of a cardboard, yellow and red JAP MAP, and posted it on bulletin boards. Payroll departments received a supply of an AMERICAN MAP, printed on gummed paper and cut into 10% sections. As departments moved toward their quotas they received strips from this map and started covering up the JAP MAP. Top item on this map was the JAP FLAG and it was not until the last 10% of the drive had been completed that the AMERICAN FLAG took its place.

The idea helped to keep up interest in the progress of the drive as few people knew what the next percentage strip would bring to the changing map. It was created by the Advertising Department of the Wisconsin Public Service Corp. at Green Bay and is available to any other group interested in using it.

■ ■

Gas Industry Can Play Important Role In National Fire Prevention Week

October 4 to 10 by Presidential proclamation has been set aside as Fire Prevention Week. The President has called upon the observation of this occasion as a part of the war effort and has charged the U. S. Office of Civilian Defense with the responsibility of its leadership.

All industry will cooperate with the President during this week. Fire Prevention Week campaign material of all types may be secured from the National Fire Protection Association, 60 Batterymarch St., Boston; from the National Board of Fire Underwriters, 1014 Merchants Exchange Bldg., San Francisco; 85 John St., New York City; 222 West Adams St., Chicago; and from the Chamber of Commerce of the United States of America, Insurance Department, Washington, D. C.

ROPER'S Practical War-Time Service Plan

Thank you for the splendid volume of gas range business enjoyed by Roper for many years. Now Roper has stopped gas range production. For the duration production facilities and skilled personnel will concentrate on one important job—producing implements of war.

But to help win the war it is important that Roper gas ranges the nation over be kept in tip-top condition. This is our responsibility—and yours. The Roper War-Time Service Plan is a practical, workable answer. Write today for this complete plan.

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The new Roper service handbook covers Roper gas range operation from A to Z. It deals with top burners, ovens, broilers, ignition, safety pilots, etc.

The handbook is supplemented by numerous illustrations. Specially prepared for you and your service organization, it will prove invaluable in service training.

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Provisional FPC Natural Gas Act Rules Announced

PROVISIONAL rules of practice under the Natural Gas Act have been amended by the Federal Power Commission in Order No. 99, effective September 15, 1942. Under this order, Part 57 of the provisional rules are amended by adding five new sections from 57.5 to 57.9, inclusive, applying to applications for certificates (non-grandfather clause) of public convenience and necessity for construction, extension, acquisition, operation, etc., under Section 7 of the Natural Gas Act as amended on February 7, 1942.

"During the war emergency," a footnote to the order states, "any applicant filing an application with the War Production Board incidental to an application for a certificate of public convenience and necessity to the Federal Power Commission should, wherever it is possible to do so, at the same time file its application with the Commission in order to facilitate action by the Commission."

The new rules require a considerable amount of information not required in the rules for application under the grandfather clause of the act. Section 57.5 states, "applications for certificates of public convenience and necessity for construction extension, acquisition, operation, etc., under Section 7 of the Natural Gas Act as amended, other than under the 'grandfather' clause of Section 7 (c)," shall set forth the information required, "incorporating any data already on file with the Commission by reference."

■ ■

SEC Moves to Hasten Sale Of 116 Scattered Properties

In a move to hasten the simplification of the Associated Gas and Electric Corp., Wilmington, Del., system, the SEC has ordered the trustees to divest the company of 116 scattered electric, water, gas and service corporations. This is in line with the trustees' proposal to eliminate the Associated Gas and Electric Corp. as a corporate entity and carve out of its holdings four separate integrated utility systems which will then be disposed of individually, either by distribution to security holders, or otherwise.

The four systems which the trustees maintain could be retained profitably along with integrated systems and incidental businesses are the New York-Northern Pennsylvania group, the Eastern Pennsylvania-New Jersey group, the Western Pennsylvania group and the Florida-Georgia group.

Included in the separation order of the 116 companies are Jersey Central Power and Light Co., Virginia Public Service Co., and the New England Gas and Electric Association and its various subsidiaries.

■ ■

Gas Distillate Producer Comes in at Lisbon Field

Drill stem tests on locations in the north flank of the Lisbon field in Claiborne Parish, La., indicates a gas-distillate producer from the Smackover lime. The well tested a steady flow of wet gas from 10,226 to 10,266 ft., working pressure building up to 1275 lbs. Gas was estimated at 12,000,000 cu. ft., open flow, with recovery seven joints of white distillate.

■ ■

Pipe Line Nears Completion

To complete an expansion program for bringing additional natural gas supplies to Arkansas industrial plants that began earlier in the year, the Arkansas-Louisiana Gas Co., Shreveport, is laying 5½ miles of 12-in. pipe.

Houston Natural Lays 25-Mile Line

USING approximately 40,000 ft. of 3-in. pipe and 80,000 ft. of 2-in. pipe, the Houston Natural Gas Corp., Houston, Texas, completed the laying of a 25-mi. pipe line from a producing well in Calhoun County to army camps planned for Matagorda Island and Matagorda Peninsula. Scheduled to take 60 days, the work was completed in slightly over a month's time. Involved was the laying of 13 mi. across marsh land and 12 mi. in salt water, sometimes at a depth of 18 ft.

The camps, laid out by the Army Air Corps for use principally as gunnery and bombing ranges, were designed to accommodate a considerable number of men, with gas an essential requirement for cooking, heating and operating gas engines to generate electric power.

Work began July 5. Almost simultaneously heavy rains turned the ranch into marsh land and it soon developed that it was even more difficult to cross the ranch with pipe than it was to lay pipe in the bay.

It was necessary to have all pipe dragged in with caterpillar tractors, while mule teams and a six-wheel drive army truck were required to complete the work on the field regulator station at the gas well. The well, isolated on the shore of Powder Horn Lake, was brought in by the Continental Oil Co. two years ago.

For the underwater construction the pipe was welded into sections on land, on pontoons, towed by tug to positions staked out in advance by the surveyors, and anchored. As each additional section of pipe was welded, it was removed from the pontoon and submerged.

The pipe joints were treated with a special somastic coating as protection against salt water, and extra precautions were taken to prevent mud, water and sand getting into the pipe.

One of the greatest difficulties presented was that supplies had to be brought from a considerable distance, making it necessary for those in charge to anticipate construction needs far in advance in minute detail, or be penalized by long delays while waiting for materials.

Compressor Unit Completed On Roswell, N. M., Main Line

The New Mexico Eastern Gas Co. of the Southern Union Gas System, Dallas, Texas, has recently completed the installation of a new compressor station on the Roswell 8-in. main line that serves Roswell, Hagerman, Dexter, Lake Arthur and the large gas-engine load in the pumping district. A Clark 400-hp. compressor was used with closed system air cooled radiators employed to cool both the engine and the 8 billion cu. ft. on compressed gas daily. Power for driving the fans of the Young-Happy cooling unit is a V-8 Ford motor. Lighting is supplied by a Kohler gas-engine-driven plant, a Bryant automatically controlled boiler connected to 1100 ft. of 2-in. pipe coils handles the heating, and a telephone system, complete with a pressure alarm, provides contact with other offices and personnel of the company. The entire station is housed in an all-steel, fireproof, 24x24x17 ft. building surrounded by a cyclone fence.

■ ■

Pipe Line Brings Additional Gas to Ohio Glass Company

A new 14-in. pipe line running from a point near Sandyville, W. Va., to a point near Marietta, Ohio, has recently been completed for the Anchor Hocking Glass Co., Lancaster, Ohio. The line brings gas from the newly discovered field of the Columbian Carbon Co. and transmits it to the Ohio Fuel Co.'s lines for delivery to Anchor Hocking's Lancaster plant. In constructing the line, Jones and Brooks, Oklahoma City, Okla., the contractors, faced many difficult problems, including the traversing of the rocky hills and slopes, the crossing of mountain streams as well as rivers, and the employment of reconditioned high carbon steel pipe that necessitated wrinkle bending.

For the first time in this district where manual labor has been used principally, the contractors moved in heavy bulldozers for clearing the right-of-way, heavy duty ditchers for digging the trench, sideboom tractors for bending, lining up the pipe and lowering-in, an angledozer for cleaning up after the line was covered, and 10 welding machines for joining.

■ ■

Work Scheduled to Begin On Trans-Florida Pipe Line

Work on the Carabelle to Jacksonville trans-Florida pipe line is scheduled to start on or about October 1, and it is expected that construction will be completed by December 15. On completion, a daily delivery of 35,000 barrels of petroleum products will be made available to Jacksonville, from where it will be distributed to centers along the Atlantic seaboard as far north as Virginia, according to a recent release from the office of the Petroleum Coordinator for War.

About 185 miles of pipe will be required for the construction which is to use only second-hand equipment and which is now being dug up and dismantled in Texas.

■ ■

Virginia Geological Study Uncovers New Gas Deposits

An encouraging development in the search for new gas deposits being conducted under the direction of Dr. Arthur Bevan was the recent discovery of natural gas in Virginia at Early Grove, 10 miles northwest of Bristol, according to a report released by the Geological Survey Division of the Virginia Conservation Commission. Dr. Bevan's work has included an investigation of the physical characteristics of the rocks in that area.

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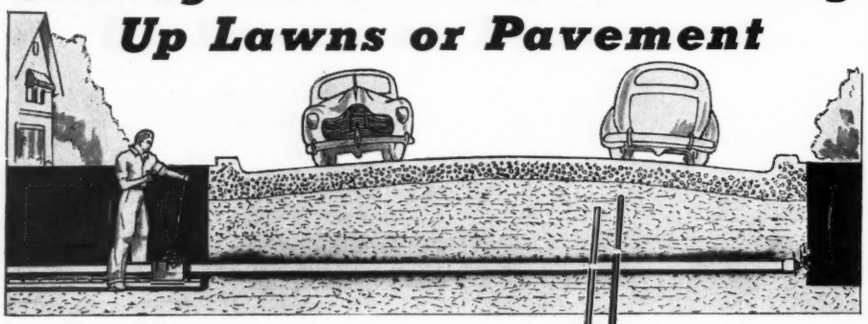
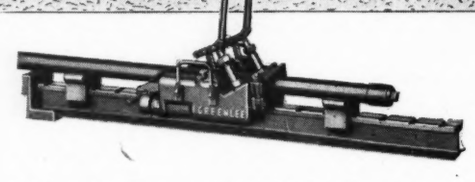
Here's How You Can Install Pipe Underground Without Tearing Up Lawns or Pavement





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GREENLEE TOOL CO.
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New Orifice Calculator Speeds Gas Computations

DEVELOPED especially for the fast and accurate checking of all factors involved in determining orifice sizes, the new W. B. P. Gas Flow Orifice Calculator, being marketed by the publishers of *GAS*, is proving an invaluable aid to gas company service men, salesmen and engineers, and gas appliance dealers, distributors and manufacturers.

With this new calculator chances of error and wasted time are eliminated in the elaborate calculations formerly necessary to work out such problems as how to size orifices for usage with gases of various gravities and heating values when installing new appliances or converting old ones to changing gas supplies, how to convert B. t. u. per hour to cu. ft. per hour of any gas from 300 B. t. u. per cu. ft., or how to estimate the amount of gas a burner can handle.

Using the calculator, the drill size necessary for a required B. t. u. input load can be quickly and easily determined merely by setting the scales and reading the answer. Orifice flows from sizes 1 to 75 in numbered drills, from sizes A to Z in lettered drills, from sizes 2/64 to 32/64 in fraction drills, can also be readily found.

The Gas Flow Orifice Calculator makes computations and reference to supplementary tables unnecessary. All answers are read directly on the various scales. Easy to use and easy to carry, this new aid to gas appliance manufacturing and servicing calculations is priced low enough that it may be purchased in quantities to supply every member of a gas company or gas dealer organization with his own calculator.

■ ■

Texas Pressure Project Initiated With One Unit

The ultimate recovery of petroleum from the East Texas field will be increased by at least 200,000,000 barrels, Petroleum Coordinator Ickes recently announced, by means of a pressure maintenance project, the first unit of which has been approved. The War Production Board has already assigned a priority rating assuring materials for construction of the project.

The project, initiated by E. DeGolyer, Assistant Deputy Petroleum Coordinator, provides for the daily injection of 90,000 barrels of water into the Woodbine sands through six injection wells which will increase the bottom-hole pressures and lengthen the flowing life of the wells.

The East Texas Salt Water Disposal Co., which is undertaking the work, is planning a program calling for the construction of injection facilities having a capacity four times that of the initial project.

Construction of the first project will be started about January 1, and is expected to take from six to eight months.

■ ■

Revised API Code Released For General Distribution

The American Petroleum Institute's Division of Production has just issued a revised second edition of its code of recommended practice on standard field procedure for testing drilling fluids. There are several additions, including a section of filtration and wall-building properties and a new section on salt content.

Copies of the revised edition, API Code No. 29: "Recommended Practice on Standard Field Procedure for Testing Drilling Fluids (Tentative)," may be obtained from the Institute at New York or 1205 Continental Bldg., Dallas, Texas, for 50c.

Texas Gas Plant Converted To Emergency Standby Use

AT A cost of $250,000, the Texas Cities Gas Co., El Paso, Texas, has reconditioned its manufactured gas plant and converted it from coal gas to coke and gas oil in order to manufacture 1050 B. t. u. gas that can be used for standby in case a break in its natural gas transmission lines, or a bombing should unexpectedly cut off its regular supply, according to a recent announcement by J. Y. Wheeler, vice president and general manager of the company.

The total capacity of the plant after rebuilding is 120,000 cu. ft. per hour, about two-thirds of the maximum summer demand and sufficient to maintain the cooking and water heating load of domestic customers. Additionally, there are three holders with an aggregate capacity of 2,000,000 cu. ft., which would be sufficient to fill regular demands for 24 hours without deliveries from either the pipe line or the standby plant.

Recently a test was run with 400,000 cu. ft. of the manufactured gas turned into the company's distribution mains. No complaints were received, and this fact was publicized in the daily papers to allay any fears that might arise in the minds of the customers later if an emergency condition confronted the city.

■ ■

Order Suspends Drilling In Hugoton Gas Field

Supplementary Order M-68-6 puts a stop to the further drilling of gas wells in the Kansas and Oklahoma field. Exceptions will be made where specific authorization is given by the Director General. The order was issued by the Director General for Operations, War Production Board, on recommendation of the Office of Petroleum Coordinator.

The order will have the effect of requiring connection of wells already drilled to pipe line facilities thus making it unnecessary to use critical materials to drill additional wells.

The order suspends the automatic features of M-68 as applied to the Hugoton field which allowed unrestricted drilling of gas wells on a spacing pattern of one well to every 640 acres.

■ ■

Laboratories Staff Outing

The A. G. A. Testing Laboratories staff held its 15th annual picnic August 29 at Pine Ridge Country Club near Cleveland. Seventy-three persons attended, including the wives and families of the staff members. Such prizes as were given were all in War Savings Stamps. A large proportion of the normal expenditures were conserved to purchase Christmas gifts for Laboratories employees now in the armed services.

Toastmaster was K. H. Flint, assistant chief testing engineer. R. M. Conner, Laboratories director, discussed briefly the growing operations of the war products department and the progress being made on its present assignments.

■ ■

Wildcat Gas Well Produces

Holding the promise of opening a new field, a wildcat well drilled by the Ohio Fuel Gas Co., Columbus, Ohio, southwest of Porterville, Ohio, has come in with a production of 1,700,000 cu. ft. per day. Several other wells are expected to be drilled in this same section as a result of the discovery.

FPC Issues First Order Under Amended Gas Act

THE Federal Power Commission September 14 issued the first certificate of public convenience and necessity under an amendment to Section 7 (c) of the Natural Gas Act to the Memphis Natural Gas Co., Memphis, Tenn. The certificate authorizes the company to continue operation of its facilities in the states of Louisiana, Arkansas, Mississippi, and Tennessee which were in bona fide operation on the day the amendment became law.

Section 7 (c) as amended requires all natural gas companies engaged in the transportation or sale of natural gas subject to the jurisdiction of the Commission to have a certificate of public convenience and necessity from the Commission authorizing their operations. Under the amendment to Section 7 (c), the Commission shall issue a certificate covering existing operations without requiring further proof that public convenience and necessity will be served by such operations and without further proceedings if the application for certificate was filed with the Commission by May 8, 1942. Applications by 142 natural gas utilities were filed with the Commission between February 7 and May 8.

The authorization announced provides that the certificate is not transferable except on Commission approval; that the action is without prejudice to the Commission's authority in other matters; that the authorization is not to be construed as affecting the determination by the Commission of the Memphis company's service area under the Natural Gas Act; and that the certificate shall be effective as long as the company continues operations in accordance with the Natural Gas Act and Commission rules and regulations.

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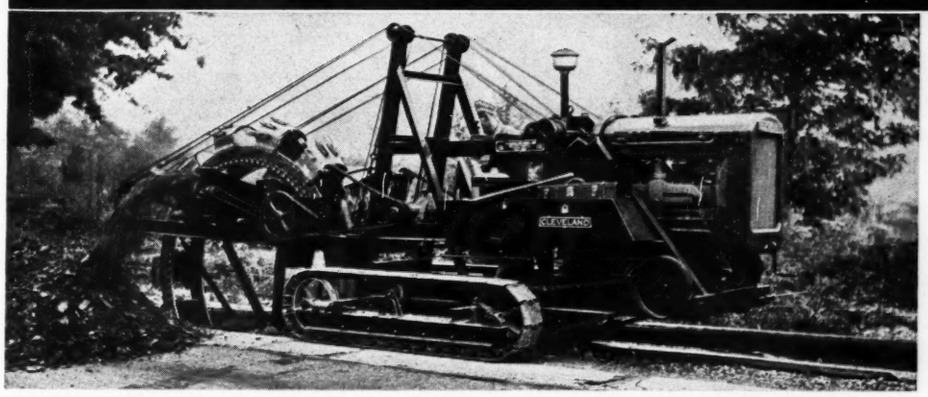

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ABSTRACTS

Current Periodicals

Generalized Thermodynamic Properties of Gases at High Pressures — S. H. Maron and Davis Turnbull. *Industrial and Engineering Chemistry*, May, 1942, pp. 544-551. Various general methods for the estimation of thermodynamic properties of gases at high pressures are classified and discussed. Particular emphasis is given to the theorem of corresponding states, and deductions are made from it. A critical resume of graphical generalized correlations of compressibilities and other thermodynamic properties of gases is included. The authors' work on the generalization of the Beattie-Bridgeman equation of state is reviewed and extended, and equations are deduced to show which properties may be generalized in terms of P_r and T_r and their dependence on these variables. A new empirical equation of state is presented, and generalized equations for various thermodynamic properties are deduced from it.

Use of Soil Surface Potential in Locating Pipe Line Corrosion—O. C. Mudd. *Oil and Gas Journal*, May 14, 1942, pp. 50, etc. When new pipe lines are planned or built, the location of probable corrosion can be predicted with fair accuracy by means of soil tests made along the route; however, this degree of corrosion can be measured only as it develops. This article describes the principles and a technique for locating pipe sections now corroding in existing lines, and for measuring the relative degree of corrosion activity. The actual nature and severity of corrosion then can be determined by uncovering the line and making visual inspections.

Arkansas Contributes Much to Sound Conservation Methods — G. B. Nicholson. *Oil Weekly*, May 11, 1942, pp. 15-19. Arkansas continues to furnish valuable oil and gas reserves, consistently expanding its potentialities, uncovering new reservoirs of oil and gas, erecting new refineries, and instigating sound conservation methods. Engineering developments of national interest are being used with valuable results in Arkansas oil fields, such as repressuring programs which are adding many thousands of barrels of recoverable oil and gas to reserves, and development of a gas-purifying industry which converts sour gas into industrial fuel, with production of sulfur as a by-product of the process.

Development, Operation, and Valuation of Oil and Gas Properties — P. J. Jones. *Oil and Gas Journal*, May 28, 1942, pp. 45-47. Part 1. Porosity, specific permeability, and geometry of spacing.

The Oil and Gas Industry of Colorado —Clark F. Barb; 130 pp.; tables, charts, and maps; April, 1942, issue of Colorado School of Mines *Quarterly*, published by Colorado School of Mines, Golden, Colo.; $2. First complete record of the oil and gas industry in Colorado, including a history of the industry in the state, a detailed description with production and geologic data of every oil field, estimates of oil and gas reserves, secondary recovery reserves, oil production costs, descriptions of each refinery, crude oil analyses, oil consumption, markets, pipe lines, natural gas, oil shale and coal substitutes.

Engineering Study Determines Advisability of Pressure-Maintenance Installation—J. D. Collet, Jr. *Petroleum Engineer*, May, 1942, pp. 62, etc. Plant constructed in North Novice field, Texas, after well tests reveal feasibility of pressure maintenance as a conservation measure.

The Application of the Girbotol Process to Industry — D. B. Storrs and R. M. Reed. *Transactions*, A. S. M. E., May, 1942, pp. 299-302. Details of the Girbotol process for the removal and recovery of acid gases, such as hydrogen sulfide and carbon dioxide, with amine solutions are outlined in this paper, and its many applications to industry are described. These fields include: purification of refinery and natural gases; removal of carbon dioxide from raw hydrogen and hydrogen-nitrogen mixtures; carbon dioxide and hydrogen-sulfide recovery; and the production of inert atmospheres.

Natural Gas in the U. S. A.—W. P. Poor. *Mechanical Engineering*, May, 1942, pp. 369-372. A discussion of its production, distribution, and utilization.

Reduction of Metallic Ores by Natural Gas—F. H. Dotterweich. *Refiner*, May, 1942, pp. 135-138. Reduction of metallic ores, especially iron ore, is being accomplished in localities favored by desirable proximity to the required raw materials such as coking coal, limestone, ores and favorable location relative to transportation. The Pacific Coast states have high-grade iron ores, but in the absence of coal of coking quality, this operation has not become practical. Announcement of the "Clarkiron" process, developed by Walter Gordon Clark of Los Angeles (*GAS*, January, 1942, p. 24), comes at a time in which the expansion and separation of the metallurgical industry is highly desirable. The process consists of the reduction of metallic ores, in relatively finely divided form, by natural gas. The process has successfully passed the pilot plant stage and is available to reduce iron, chrome, nickel, vanadium, and titanium on a commercial basis. This process promises reduction of ores in localities heretofore ruled out due to the absence of coking gas and encourages the development of industry where large deposits of natural gas and the desired grade of ores are available. Described and illustrated.

Increasing Recovery of LPG in Natural Gasoline Plants—J. W. Wilson. *Oil and Gas Journal*, May 14, 1942, pp. 66, etc. This paper is limited to suggestions of ways and means of increasing the extraction of liquefied petroleum gases with existing equipment only. No attempt is made to present any fundamentally new ideas. Instead, certain practical methods, previously presented, or in use by others are reviewed briefly, and references given for further reading by those who care to do so.

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Physical Constants of Low Boiling Point Hydrocarbons and Miscellaneous Compounds—R. Matteson and W. S. Hanna. *California Oil World*, 1st April issue, 1942, pp. 5, etc. During the past 10 years a number of useful compilations of physical constants, ranging from the California Natural Gasoline Association's concise tabulation to the exhaustive volumes by Egloff, have been published. None of these, however, serves as a compact table suitable for notebook use by the engineer or research technologist in the petroleum and allied industries. To fill this need a table of the physical constants of a number of hydrocarbons, principally in the gasoline boiling range, and certain miscellaneous compounds of interest in the petroleum and natural gas industries, has been prepared. The tabulation of constants is given as Table 1, and the bibliography of references from which the basic constants were derived is contained in Table 2. A. C. N. G. A. paper.

Psychrometry of Cooling Towers—Edward Simons. *Chemistry and Metallurgy*, April, 1942, pp. 82-86. Three years ago *Chemistry and Metallurgy* published a group of articles on the fundamentals of water cooling design. Practical information was given to assist in actual design. Since their appearance, there have been a number of developments in both theory and practice. This article is a quick review of fundamentals and a tie-in with the previous series.

Reports

Time Temperature District Gas Regulators—Chas. D. Peterson, Fisher Governor Co., Marshalltown, Iowa. Discussion confined to the construction, operation, and use of district gas regulators to which have been applied temperature boosting and time control equipment. District gas regulators are classified as those supplying gas to the low pressure gas-burning equipment of domestic and industrial users. Such district regulators may have as low as 1 or 2 lbs. on the inlet, but usually this inlet pressure is about 5 to 15 lbs. Higher inlet pressures are sometimes encountered, but they are the exception rather than the rule. The low pressures delivered to the appliances rarely are less than 4 oz. and usually are in the range of 4 to 8 oz., but may in some cases be slightly less than 4 oz. and occasionally get up to pressures as great as 14 to 16 oz. Usually in a town of any size there are two or more regulators operating in parallel and taking the gas from the high pressure or intermediate pressure system and feeding gas into the common low pressure and inter-connected system. Each regulator takes care of the gas load or demand in the domestic or industrial area surrounding that particular regulator.

The time temperature district gas pressure regulators are used for two purposes: (1) to maintain a lower average pressure on the system to reduce the amount of leakage; (2) to eliminate the necessity for manual adjustment of the district regulator to save time of the service men as well as car mileage; and furthermore, to do a better job of adjusting reduced pressures to load requirements than can possibly be done through manual adjustment or control.

As the title implies, this system of regulation controls as regards both atmospheric temperature and time of day or night. Temperature control is by thermostatic temperature bulb element; time control consists of mechanically or electrically driven clock with adjustable cam arrangement.

Research Paper 1446—Soil Corrosion Studies, 1939—K. H. Logan. Bureau of Standards bulletin covering coatings for the protection of metals underground.

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PEOPLE

Richard J. Plank, chief civil engineer and assistant superintendent of distribution for The Peoples Natural Gas Co., has been loaned for an indefinite period to the Power Branch of the War Production Board, **E. M. Borger,** president of Peoples, announced recently. Mr. Plank has been in the employ of The Peoples Natural Gas Co. for the last 10 years. Before that he was with the Curtiss-Wright Flying Service and the United States Forest Service. He has been assigned to the division of the Power Branch which has the responsibility of assuring a sufficient supply of gas to war industries.

R. J. Plank

• •

Eight employees of the United Gas Corp., Houston, Texas, have been transferred and promoted to new positions in the last 60 days, according to H. P. Carroll, operating manager. They are as follows:

Harry Cain, from Longview to Lufkin as local manager, effective July 13, 1942.

Ben Boston, from Lufkin to Seguin as local manager, effective July 20, 1942.

Fritz Belschner, from Seguin to Hondo as local manager, effective July 27, 1942.

A. B. Caldwell, from Laredo to Gladewater as local manager, effective August 1, 1942.

G. H. Bumpas, from McComb to Lake Charles as engineer, effective August 1, 1942.

W. A. Hooper, engineer, from Lake Charles to the general office engineering department.

T. B. Browne, from Jennings to Bogalusa as local manager, effective August 1, 1942, replacing **Sam B. Ricks,** who has entered the armed services.

J. D. Ireland, from Lake Charles to Jennings as local manager, effective August 1, 1942.

• •

The appointment of **R. J. Laidlaw** to the position of manager of the Cleveland district office has been announced by Worthington Pump & Machinery Corp. Mr. Laidlaw will succeed **A. J. Klug,** who will now devote his entire time to special work with certain important industries in the Cleveland district. Mr. Laidlaw has been connected with the Worthington organization in various capacities since his return from overseas in 1919 from active service with the 32nd Division of the 120 M. G. Battalion in World War I.

• •

Bertram S. Truett, for five years a sales engineer with the American Meter Co., San Francisco, Calif., has been commissioned a lieutenant, junior grade, in the Navy and is now stationed in Newport, R. I., undergoing special training before being assigned to the Office of Inspector of Naval Materials with headquarters in a western city.

• •

Harold L. Gaidry, gas engineer of New Orleans Public Service, Inc., New Orleans, La., has been renominated as chairman of the Technical Section for the coming year. **John H. Wolfe,** general superintendent of gas operations, Consolided Gas, Electric Light & Power Co., Baltimore, Md., and present vice chairman of the section, was slated to succeed Chairman Gaidry, but was unable to accept the nomination due to pressure of war work. **Charles F. Turner,** chief chemist of The East Ohio Gas Co., Cleveland, Ohio, has been nominated for vice chairman of the Technical Section.

H. L. Gaidry

• •

Rupert A. Chaffee, for four years engaged in engineering work for Clark Bros. Co., Inc., of Olean, N. Y., resigned his position in July to enter military service and has been assigned to the Academic Department of the Army Air Forces Technical Training Command at Sheppard Field, Wichita Falls, Texas, with the rank of second lieutenant.

• •

Four veteran members of the Consumers Power Co., Jackson, Mich., natural gas organization assumed new titles and added responsibilities August 1.

H. L. Fruechtenicht, Jr., who was gas field superintendent, is now general natural gas superintendent. As such he will have charge of all phases of natural gas production, compression and transmission, reporting to **D. E. Herringshaw,** general gas engineer. **H. J. Neilson,** formerly gas transmission superintendent in the Bay City-Saginaw divisions, has assumed charge of transmission through all company pipe lines, including those serving the Lansing and Alma areas. His title is natural gas transmission superintendent.

Don G. Dakin, formerly gas production superintendent of the Flint division, is now compression superintendent, in charge of the operation of four compressing stations. Another to be built within the next few months on the Muskegon River in Clare County also will be under his jurisdiction. Clarence M. Peters, previously assistant to Mr. Fruechtenicht, has succeeded him as gas field superintendent. He has charge of production in the eight Michigan gas fields where Consumers operates.

The reorganization is in line with the current expansion of the company's natural gas operations. (See page 46.)

• •

W. L. Looney has been appointed assistant district supervisor in the pipe line department of Lone Star Gas Co., Dallas, Texas. Mr. Looney replaced **A. B. Finley,** who is taking a station job at the division headquarters located near Irving. Mr. Looney will be

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WAR BULLETIN

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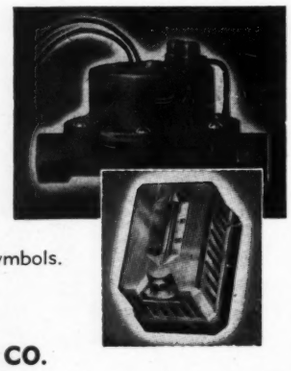

KLIXON

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in charge of the main line gas service. He was formerly assistant supervisor in the Terrell division.

• •

Katherine Rathbone, home service director in the Santa Monica district, Southern Counties Gas Co., Los Angeles, Calif., has been appointed home service sponsor of the Pacific Coast Gas Association, according to a recent announcement by **R. J. Phillips,** San Diego Gas & Electric Co., San Diego, Calif., who is chairman of the Association's sales and advertising section.

• •

Gordon M. Jones, formerly assistant sales manager, Consumers Gas Co., Reading, Pa., has been promoted to sales manager, following the retirement of **J. Calhoun Smith** after 26 years of service in this position.

• •

H. M. Brundage has been appointed deputy regional director of the War Production Board in New York City, according to a recent announcement of John P. Maguire, regional director. Since March, Mr. Brundage has served as chief of the Appliance Section of WPB Plumbing and Heating Branch.

• •

J. E. B. Gibbons

J. E. B. Gibbons has been appointed special representative to the oil and gas industry for the Wailes Dove-Hermiston Corp., according to an announcement by **W. H. T. Thornhill,** vice president. Mr. Gibbons was formerly associated with the Dresser Manufacturing Co., Bradford, Pa., and the Victaulic Co. of America.

• •

J. R. Jarvis, superintendent of gasoline plants, Lone Star Gas Co., Dallas, Texas, has announced that effective August 1, 1942, **J. L. Hamilton,** who has been superintendent of the Grapeland recycling plant, became superintendent of the Opelika recycling plant. **R. V. Burns,** who has been assistant superintendent at the Grapeland recycling plant, has now been made superintendent of the plant.

• •

Miss Roy Sue Wimberley of Italy, Texas, has recently been appointed home economist for the Corsicana division of Community Natural Gas Co., replacing **Miss Winnell Cantrell,** who was transferred to the Waco division. Miss Wimberley is a graduate of Texas State College for Women at Denton. She will begin her duties in Corsicana some time after the first of September.

• •

Winslow Fitch, sales engineer of Utility Fan Corp., Los Angeles, Calif., has been appointed western representative on the American Gas Association Committee on Approval Requirements for unit heaters.

• •

T. S. Maffitt, Jr., formerly safety manager and editor of the *Hoco News,* Houston Pipe Line Co., Houston, Texas, is now serving with the Ferrying Division, Air Transport Command of the U. S. Army Air Corps.

• •

Dr. Frederick W. Sullivan, Jr., has been appointed technical director of the Institute of Gas Technology, Chicago, Director Harold Vagtborg announced recently. The appointment became effective September 1.

Dr. Sullivan will come to the Gas Institute

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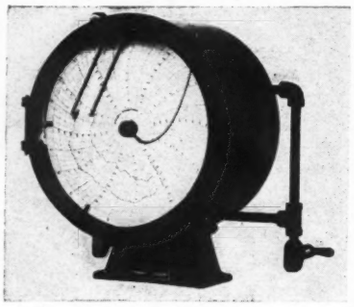

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from the Barrett Division of Allied Chemical & Dye Corp., where he has been manager of chemical research since 1940. Previous to his service there, he was director of research for Standard Oil Co. of Indiana. He had joined this organization as assistant director of research in 1923 and left as director in 1938.

• •

William H. Vaughan, gas engineer of Palestine, Texas, has been named by the Texas Department of the American Legion as its "Man of the Year" candidate for the $1000 Lewis S. Rosenstiel award which goes to the legionnaire who has performed the most useful community service during the year.

The award was presented to the national winner at the Legion convention in Kansas City, Mo., last month.

Vaughan organized Company "D," 37th Battalion, Texas Defense Guard, and as commanding officer of the company has maintained one of the best Texas Defense Guard companies. He has actively supported the county officials and the director of civilian defense in this work.

• •

An oddity in the call to the armed services when **Sara Byrnes,** personnel department, Philadelphia Co., received a call to the Army the same day as her brother, **T. Joseph Byrnes.** Miss Byrnes was accepted for the WAAC.

• •

O. A. Kinzer, house heating and utilization engineer of the Dallas Gas Co., has received a commission as captain in the Engineers Corps, District Engineer's Office, Tulsa, Okla.

C. K. Patton, new business manager of Dallas Gas Co., announced that **Chester C. Young,** assistant sales supervisor, will carry on Mr. Kinzer's duties for the duration of the war.

Robert C. Rogers of the sales staff has recently gone into the Civilian Division of the Army Engineering Department, and **Bart McKee** has received a commission of second lieutenant in the Army Air Corps.

• •

J. Ward Crankshaw, sales manager of the Allentown-Bethlehem Gas Co., Allentown, Pa., for more than 30 years, retired recently to enjoy a well-earned rest from active duty. **Harry M. Platt,** former commercial and industrial representative for the company, succeeds Mr. Crankshaw as sales manager.

• •

Changes in organization of Public Service Corp. of New Jersey were announced in August as follows: Vice President **Robert A. Zachary** became vice president in charge of public relations. The office of director of publicity was disassociated from the office of vice president in charge of public relations. **Walter Fox Allen** is in charge of the publicity and advertising department, continuing as heretofore as director of publicity. These changes were occasioned by the retirement on August 19 of **John L. O'Toole** as vice president in charge of public relations.

• •

Election of **E. H. Eacker, Otto Price** and **Thomas F. Smith** to vice presidencies of the Boston Consolidated Gas Co. was announced recently by **E. M. Farnsworth,** president. Mr. Eacker joined the Boston company in 1931 as assistant to the vice president in charge of distribution. Since 1937 he has been assistant to Mr. Farnsworth. He is a graduate of Massachusetts Institute of Technology. Mr. Price has been auditor of Boston Consolidated since 1936 and is now vice president in charge of accounting. Mr. Smith, formerly assistant vice president in charge of distribution, was promoted to vice president in charge of distribution. He became affiliated with the company in 1926.

Deputy Coordinator **Ralph K. Davies** has announced the appointment of **D. E. Buchanan** of Tulsa, Okla., as director in charge of the Office of Petroleum Coordinator, District No. 3, with headquarters in Houston, Texas. Mr. Buchanan succeeds **Grady H. Vaughn,** who has been transferred to Washington in connection with a nation-wide survey concerning the reclaiming of oil field equipment.

• •

Harold G. Laub, office engineer for the distribution department, Southern California Gas Co., Los Angeles, has been commissioned a captain in the U. S. Army, reporting to the staff of Major General **Walter K. Wilson** in San Francisco early in September. Captain Laub, who had spent some 12 years as an army officer before his affiliation with the Southern California Gas Co., will be particularly responsible for the coordination of Civilian Defense activities with Army activities in the San Francisco Bay region.

H. G. Laub

• •

On September 5 three men well known to the Pacific Coast gas industry left for the Naval Training Station at Newport, R. I., with commissions as full lieutenants in the U. S. Navy. These men were **C. A. Thorp,** assistant research engineer, Southern California Gas Co., Los Angeles; **E. M. Cloran,** sales engineer, on leave from the Pittsburgh Equitable Meter Co., Los Angeles; and **Frank Thompson,** engineer with the California State Railroad Commission, San Francisco.

• •

Alan P. Tappan, vice president of the Tappan Stove Co., Mansfield, Ohio, has taken a leave from his company to accept a commission of captain, A. A. F., Air Service Command, Wright Field, Dayton. Mr. Tappan was a flying instructor in the last war, being promoted to officer in charge of flying with the 312th Squadron at Bolling Field. After the first World War, he was commissioned as a captain, Specialist Reserve, and was in charge of the Reserve Officers Training Program at Mansfield. Besides his activities in the Tappan Stove Co., Mr. Tappan has served on many committees of both the A. G. A. and the A. G. A. E. M.

• •

Floyd L. Carmichael, manager, Fort Worth, Texas, division of the Lone Star Gas Co., has been elected a member of the executive committee of the Fort Worth Council of Social Agencies.

• •

W. D. Moore, president of the American Cast Iron Pipe Co., received the Geo. W. Fuller Memorial Award during the annual convention of the American Water Works Association in Chicago. The Fuller Award is presented each year to those members of each A. W. W. A. section who have rendered distinguished services in the water supply field.

• •

In furthering its wartime services to the gas industry, Servel, Inc., has appointed **Jessie McQueen,** home service counsellor of the American Gas Association, as a member of the Home Volunteer Advisory Board. Miss McQueen is the second member to be appointed to the board. She joins **Miss J. Ernestine Becker,** nationally known nutrition authority, who heads the board.

Miss McQueen has been home service counsellor for the American Gas Association for 13 years and is personally acquainted with

COMPUTING THE GAS FLOW OF ORIFICES IS FAST ACCURATE EASY

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- **Save Up to ½ the Usual Time**
- **Eliminate All Chance of Error**
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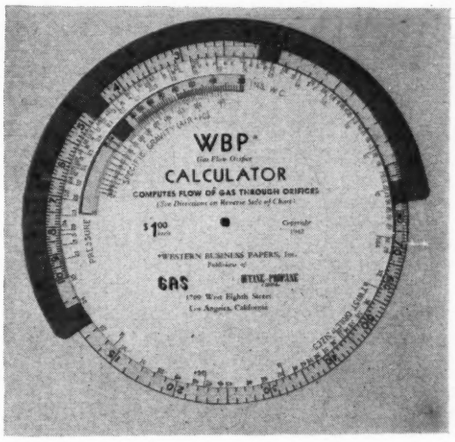

Time saving is one of the big advantages in using the Gas Flow Orifice Calculator. In a test calculation, the computation was made first by the standard paper-and-pencil method . . . then the same computation was made with the Calculator in less than half the original time. Save man hours with the W. B. P. Gas Flow Orifice Calculator.

Invaluable to engineers and shop men alike . . . all utility industrial gas salesmen, industrial service engineers, domestic appliance service departments, gas appliance manufacturers, and all others who have occasion to check or determine orifice sizes for natural, manufactured, or liquefied petroleum gases.

For fast and accurate checking of all factors relative to orifice sizing . . . B. t. u.'s per hour, cu. ft. per hour, gas pressures, drill sizes, etc. Calibrated for orifice coefficients from .6 to 1; gas pressures from .5 to 15 ins. of water; specific gravities from .3 to 2.0; and drill sizes from No. 75 to ½ in.

No other calculator is available to help you short-cut these important and complicated calculations. Simple to operate, it eliminates the possibilities of error inherent in pencil-and-paper computations.

Priced for quantity purchase to enable you to obtain a sufficient number for everyone in your organization concerned with orifice sizing. Privilege to return within 10 days, for any reason, further assures your satisfaction. We pay postage on orders accompanied by remittance. Add 3% sales tax on California orders; 10% excise tax on Canadian orders.

How Calculator Operates

To Find Drill Size

1. Rotate movable dial until specific gravity coincides with gas pressure.
2. Rotate movable segment until proper orifice coefficient coincides with desired gas quantity (cu. ft. per hr.). If orifice coefficient is not known, use 0.8.
3. Read drill size on movable dial opposite the arrow (0.8) on the orifice coefficient scale of movable segment.

To Find Cubic Feet Per Hour From B. t. u. Per Hour

1. Rotate movable segment until heating value of gas (B. t. u. per cu. ft.) coincides with gas quantity in thousands of B. t. u. per hour on quantity scale.
2. Read gas quantity in cu. ft. per hour against 1.0 (orifice coefficient scale).

To Find Quantity (Cu. ft. Per Hour) for Given Drill Size

1. Rotate movable dial until specific gravity coincides with gas pressure.
2. Rotate movable segment until arrow (0.8) on the orifice coefficient scale is opposite appropriate drill size.
3. Read quantity (cu. ft. per hr.) against appropriate orifice coefficient. If orifice coefficient is not known, use 0.8.

To Find B. t. u. Per Hour Given Cubic Feet Per Hour

1. Rotate movable segment until 1.0 on the orifice coefficient scale coincides with the gas quantity in cu. ft. per hour.
2. Read corresponding B. t. u. per hour in thousands against appropriate heating value (B. t. u. per cu. ft.).

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RAPID TIMING
GREAT FLEXIBILITY
Milwaukee Gas Specialty Company
MILWAUKEE WISCONSIN

home service programs of nearly every gas company in the United States. Much of the industry's wartime home service activities have been developed with her assistance.

• •

Ed DeGroote, recreational director of Servel. Inc., at Evansville, Ind., has been elected to the national board of directors of the Recreation Association for American industry. Mr. DeGroote will serve on the board as a representative of the east central region, including Indiana, Illinois, Ohio, Michigan and Wisconsin.

• •

Bringing to 24 the number of men from the A. G. A. Laboratories to join the armed forces of the United States, two members of the Los Angeles offices and two members of the Cleveland offices entered the services recently. From Los Angeles, **O. N. Simmons** went to the naval reserve with the rank of lieutenant, junior grade, and **J. J. Kavanaugh** went to the army with the rank of second lieutenant. From Cleveland, **Albert J. Klika** went to the ground force of the Army Air Corps, and **Herbert A. Taylor** went to the Army.

• •

Tom L. Holcombe, formerly of Little Rock and Lockesburg, Ark., has been named southwest representative with headquarters in Shreveport, La., for Dearborn Chemical Co., of Chicago. The territory to be served from Shreveport will include Louisiana, Arkansas, East Texas and West Tennessee. Mr. Holcombe has been a resident of Shreveport since 1926, associated with the Arkansas-Louisiana Gas Co., for which he was chief clerk in the gas pipe line department when he joined the Chicago company.

• •

James Argo, formerly gas sales supervisor of the Florida Light & Power Co., has been appointed sales manager of the Tampa Gas Co., Tampa, Fla. Mr. Argo is also chairman of the sales committee of Florida-Georgia Gas Association.

• •

Philip H. Patchin, a director of Standard Oil Co. of California, who has been in charge of public relations activities, has been elected a vice president and assigned to new duties in Washington, D. C.

Obituaries

A. C. Howard

A. C. Howard, whose long and distinguished career in the gas industry carried him to all parts of the United States, died recently. The son of Admiral Thomas Benton, Mr. Howard graduated from Annapolis and served in the Spanish-American war aboard the U. S. S. Newark before actively entering the industry.

Starting as cadet engineer from 1901-1911 with United Gas Improvement Co., Philadelphia, Pa., he became assistant superintendent. From 1911 to 1927 he served as gas engineer for the United Gas & Engineering Corp., becoming vice president and consulting engineer as well as a director. He was first vice president of the Southern Gas & Electric Corp., vice president and general manager of the Dixie Gas & Fuel Co., Houston, Texas. He was connected with the following companies: Director of the El Paso Natural Gas Corp., vice president and director of the Eastern States Gas & Power Co., president and director of the Sumter Gas & Power Co., Sumter, S. C.; treasurer and director of the Anderson Gas & Utilities Co., and director of the Greenwood Gas & Fuel Co. A director of the Oklahoma Natural Gas Corp., he prepared natural gas reports for the Electric Bond & Share Co. on properties in New Orleans, La.; Memphis, Tenn., and Jackson, Miss.; appraised properties of the Southwest Gas Co., San Antonio, Texas. With an operating experience in some 15 states, he appraised properties for rate making, purchase or bond purposes in 20 states and the province of Ontario, Canada. He was the inventor of the "Howard Charger," used on many gas water sets.

■ ■

Helen C. Wilke

Helen C. Wilke

Mrs. Helen C. Wilke, secretary-treasurer of Pacific-Airmax Corp., Huntington Park, Calif., died Wednesday, September 16. For more than sixteen years Mrs. Wilke was employed in the accounting department of Pacific Gas Radiator Co., becoming secretary-treasurer of the company about three years ago. She retained this post in the Pacific-Airmax Corp., recently formed through the merger of Airmax Corp., San Diego, Calif., with Pacific Gas Radiator Co., Huntington Park, Calif.

■ ■

S. J. Ratcliffe

S. J. Ratcliffe, director and treasurer, and employee for more than 30 years of Peoples Natural Gas Co., Pittsburgh, Pa., died last month in the Pittsburgh Hospital. Always active in American Gas Association affairs, he was a member of the Accounting Section. He served also as chairman of the Pennsylvania Natural Gas Men's Association accounting committee.

He was treasurer and director of New York State Natural Gas Corp., Pittsburgh, Pa.; Keuka Construction Corp., and a director of Lycoming Producing Corp. and Lycoming United Gas Co. He is survived by his brother, George Ratcliffe, president, Baroid Sales Co., Houston and Los Angeles.

■ ■

William R. Shiperly

William R. Shiperly, head of the field service work of the Chaplin-Fulton Manufacturing Co., died at his home in Pittsburgh, Pa., after an illness of several months. He had been with the Chaplin-Fulton Co. continuously since 1918, when he entered its employ as a machinist, and had served in various capacities. He had charge of the testing laboratories of the company before he undertook the field work through which he became most widely known.

■ ■

George Brinkley

George Brinkley, Ardmore district manager of the Oklahoma Natural Gas Co., Tulsa, Okla., died recently. In his 26 years with the company he had successively been in the commercial office in Tulsa, local manager of the El Reno office, and finally district manager at Ardmore, a position which he attained in July, 1934.

■ ■

Otto Dander

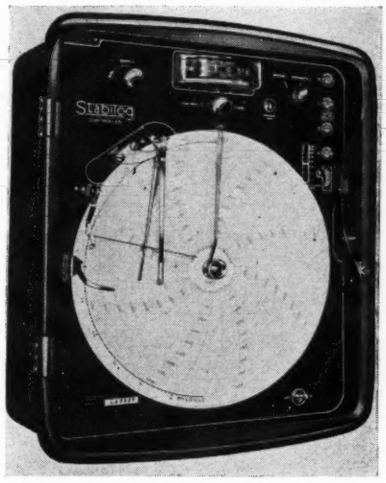
Otto Dander, official of the Pacific Gas and Electric Co., San Francisco, Calif., died recently.

PRODUCTS

Controller

Foxboro Co., Foxboro, Mass.
Model: Hyper-Reset.

Description: This is not an instrument or a mechanism, but a control function, available in the newly-designed Model 30 Stabilog Controller, for application where process-lag is considerable. Its importance has been demonstrated by tests in which Hyper-Reset consistently re-established



process stabilization, following an upset, in one-quarter of the time, and with only one-half the upset effect, as compared with a similar controller having only the usual reset. Hyper-Reset reduces the effects of a process disturbance by making initial temporary additional corrections, which are proportional to the rates of change of the measured value caused by the disturbance. The normal reset follows, establishing stabilization. But the several control functions carried out by Hyper-Reset are simultaneously and automatically adjusted.

• •

Liquid Separator

Blaw-Knox Co., Pittsburgh, Pa.
Model: Pipe Line Tracyfier.

Application: To separate any liquid or solid particles from any gas or vapor, water from air, water from steam, drops of oil from vapor. Used in a steam line, it is said to scrub all moisture from the steam, leaving it 100% dry, 100% clean, so that standard specification steam is delivered. In steam lines to stills, dryers, processes, dye vats and cookers, it is said to stop the passage of water containing impurities that would interfere with efficient operation. In gas and vapor lines containing entrained mist, it is said to thoroughly clean and collect the entrainment in a receiver.

Description: Made in a variety of sizes from ¾-in. to 6-in. with minimum operating gauge pressures from 5 to 300 lb. and capacities from 104 lb. of saturated steam per hour to 25,100. Made of various types of iron and steel construction, according to the model supplied.

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TABLE OF LEAKAGE REDUCTION

Diameter of Main—Inches	Length of Main—Feet	Percentage Leak Reduction
8	620	100
6	582	95
6	92	100
4	1,200	100
4	1,700	91
3	618	100
3 equiv.	43,800	60

"Carboseal" Anti-Leak is especially recommended now because it . . .

1. Saves labor. Only a small crew is required to apply "Carboseal" Anti-Leak.
2. Saves critical materials. Quantities of steel and rubber are required in the mechanical method of correcting bell-and-spigot joint leakage, but not in the treatment by "Carboseal" Anti-Leak.
3. Saves money. The average cost of "Carboseal" anti-leak treatment is about 50 cents per joint, a fraction of the cost of leakage correction by other means.
4. Saves time. Application of "Carboseal" Anti-Leak requires an average of four filling connections to the main per mile—excavation and repaving are almost entirely eliminated.

For further information, write for the book *Correcting Leakage in Gas Distribution Systems with "Carboseal" Anti-Leak.* It will be sent to you without obligation.

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NATIONWIDE SALES AND STOCKS

TOTAL CUSTOMERS AND REVENUE FOR MANUFACTURED AND NATURAL GAS INDUSTRY FOR SIX-MONTH PERIOD ENDING JUNE 30, 1941-1942

	1942	1941	Change	Per Cent Change
Customers				
Domestic (incl. house heating)	17,679,100	17,056,000	+ 623,100	+ 3.7
Commercial	962,300	942,200	+ 20,100	+ 2.1
Industrial	78,900	75,900	+ 3,000	+ 4.0
Miscellaneous	14,300	13,500	+ 800	—
TOTAL	18,734,600	18,087,600	+ 647,000	+ 3.6
Revenue (Dollars)				
Domestic (incl. house heating)	354,390,100	326,627,100	+27,763,000	+ 8.5
Commercial	64,212,000	59,188,900	+ 5,023,100	+ 8.5
Industrial	116,099,900	103,133,800	+12,966,100	+12.6
Miscellaneous	3,392,700	2,514,100	+ 878,600	—
TOTAL	538,094,700	491,463,900	+46,630,800	+ 9.5

Gas Use Gains In First Half Of 1942

IN THE first six months of the war, total customers served by manufactured and natural gas utilities amounted to 18,734,000 on June 30, 1942. As compared to the same date a year ago, this represents an increase of 647,000 customers, or 3.6%. Residential customers increased 623,100 to 17,679,100, while non-residential customers totaled 1,055,500, or 23,900 more than were reported on June 30, 1941.

Revenues of manufactured and natural gas utilities aggregated $538,094,700, or 9.5% more than for the first six months of 1941. Revenues from the sale of gas for industrial uses gained 12.6%, while revenues derived from residential sales (domestic and house heating) increased 8.5%. Commercial revenues also increased 8.5% over the same period of last year.

Natural gas sales for the first half of 1942 revealed substantial increases over the same period of last year. Industrial sales increased 7.7% to 427,206,100,000 cu. ft. This is an actual rise of 30,420,200,000 cu. ft. over industrial sales recorded during the first six months of the preceding year. Sales for electric generation increased 15.2% and totaled 103,953,400,000 cu. ft. for the first six months of this year.

Total sales of natural gas, up to and including June 30, 1942, amounted to 931,814,400,000 cu. ft., an increase of 11.6%, or 97,146,200,000 cu. ft. from a year ago. Sales for domestic purposes (including house heating) increased 13.9%.

Natural gas customers increased 369,500, or 4.7%, to 8,192,300 on June 30, 1942. The bulk of this increase was recorded in "Domestic" which now totals 7,614,900, or 344,100 more than a year ago. Industrial users increased 1600 to 43,200, and commercial, now numbering 531,600 customers, increased 23,600 over the number served on June 30, 1941.

Sales of manufactured gas were also up in all classes for the first half of 1942, the largest percentage increase being recorded by "Industrial." This classification increased 18.6% to 45,300,300,000 cu. ft. for the period ending June 30, 1942. This represents an actual increase of 7,100,900,000 cu. ft. over the total of 38,199,400,000 cu. ft. reported during the first half of 1941.

Increases in other classes of manufactured gas sales were as follows: Domestic, 2.4%; house heating, 16.8%; commercial, 4.7%. The total sales amounted to 232,374,200,000 cu. ft., or 8.7% more than for the first six months of 1941.

Customers connected to the lines of manufactured gas utilities on June 30, 1942, totaled 10,542,300. This represents an increase of 2.7%, or 277,500 over the number reported on the same date of 1941.

The main body of these additional users were classified as "Domestic." Totaling 9,705,700 on June 30, 1942, this classification recorded an increase of 213,500 over the figure reported on the same date a year ago. During the same period, house heating customers rose to 358,500, an increase of 65,500; industrial customers increased 1400 to 35,700. Commercial customers declined to 430,700, a drop of 3500 from the number reported on June 30, 1941.

■ ■

Radio Show Tells Heating Industry's War Effort

The vital role of automatic heating equipment manufacturers, dealers and service men in the war effort was brought home to the radio public recently when the Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., dedicated its "Alias John Freedom" programs on the Blue Network to the gas industry.

All commercial announcements on the program, which goes out over a network of 125 stations, were devoted to telling the gas industry's part in war production and in "keeping the home fires burning."

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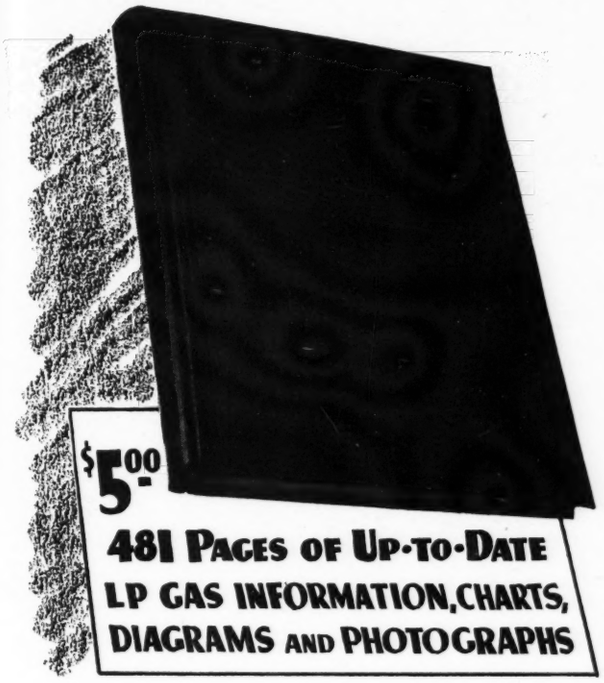

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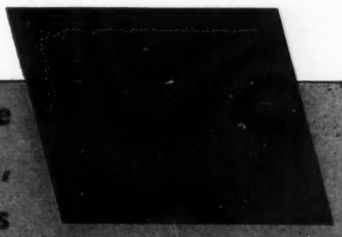

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Underground Storage in California

THE underground storage of natural gas in the exhausted oil field at Playa del Rey near Los Angeles, Calif., to serve as a standby reservoir for peak load days in Southern California, has been approved by the interested Federal governmental agencies and work has already begun on the laying of interconnecting pipe lines and the compressors.

Under the arrangements completed in Washington, the field will be taken over immediately by the Defense Plant Corp. The Southern California Gas Co., Los Angeles, Calif., has been designated by the Federal government as the operating agency to store the surplus natural gas in the field and withdraw it as needed. Sources of the gas, which is excess summer production, are the San Joaquin Valley, Ventura and Los Angeles oil and gas fields.

Richard Sachse, a member of the California Railroad Commission, and Roy A. Wehe, gas and electrical engineer for the Commission, were members of the California delegation which negotiated federal participation in the project. It was under sponsorship of the California Commission that preliminary work on the conservation plan was accomplished.

Mr. Wehe stated that the Playa del Rey storage was designed to accomplish four chief objectives:

1. Provide an underground storage basin for natural gas with a capacity estimated 20 to 30 times greater than all the present aboveground capacity in Southern California.
2. Store a reserve supply of natural gas which will insure the supplementary amount necessary to supply the demand on 100 cold peak load days.
3. Greatly relieve the mounting problem of providing gas for Southern California which is becoming acute due to the tremendous war production in the section with a consequent sharp gain in domestic as well as industrial demands.
4. End the waste of great quantities of natural gas by blow-off. This has been a necessary evil of oil production in the past because no facilities were available for storage.

Ownership in the Playa del Rey field is divided between the Union Oil Co., Los Angeles, Calif., and several hundred independent lease holders. It is estimated between 2 and 4 billion cu. ft. of gas can be stored in the basin eventually, permitting withdrawal of around 25 million cu. ft. daily.

Montana-Dakota Utilities Co. Investigated by Commission

An investigation of the Montana Dakota Utilities Co., Minneapolis, Minn., was ordered by the Federal Power Commission to enable the Commission to determine whether it is a natural gas company within the meaning of the Natural Gas Act, and whether any rates, charges, or classifications subject to the Commission's jurisdiction are unjust, unreasonable, or discriminatory.

The investigation was instituted on the Commission's own motion following a complaint filed December 6, 1941, by the Mondakota Development Co. of Billings, Mont., alleging that the rates tendered by defendant for the transportation of natural gas for complainant are unjust, unreasonable, and unduly discriminatory, and requesting an order of the Commission requiring defendant to transport natural gas for complainant at rates determined by the Commission.

■ ■

FPC Oral Hearing Granted To Interstate Natural Gas Co.

THE Federal Power Commission has announced its order granting the petition of the Interstate Natural Gas Co., Inc., Monroe, La., for oral argument before the Commission *en banc*, October 14, 1942, on the issues raised in recent hearings on proceedings involving a petition filed by the Louisiana Public Service Commission for an inquiry into the rates of the Interstate company and an investigation of the Interstate's wholesale rates instituted on the Commission's own motion. Hearings were held on the consolidated proceedings in New Orleans, La., from June 17 to June 24 and on July 1 in Washington.

Charging that Interstate's natural gas rates and transportation charges to other public utilities and municipalities are unjust and unreasonable, the Louisiana Commission's complaint requested that Interstate be ordered by FPC to show cause why such rates should not be reduced.

The investigation instituted on the Commission's own motion was undertaken for the purpose of enabling the Commission to determine whether the Interstate company, which sells natural gas for resale in Louisiana and Mississippi, is subject to provisions of the Natural Gas Act, whether its rates and charges are unjust or discriminatory and, if so to fix equitable rates for those transactions which come within the Commission's jurisdiction. The cities of New Orleans and Baton Rouge were permitted to intervene in the proceeding.

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Natural Gas Operates Car Experimentally in Canada

Natural gas has been used with some success in the propulsion of an automobile owned by W. H. Thornton of the Northwestern Utilities, Ltd., Edmonton, Alberta.

Mr. Thornton carried approximately 50 cu. ft. of gas in a rubber bag attached to the top of the car. With a Reynolds regulator attached and with the carburetor adjusted to suit natural gas, the car ran about eight miles on the 50 ft. of gas. At this rate of consumption, it is estimated, 1000 cu. ft. equivalent to 1 gal. of gasoline, will run a car for 160 miles.

While the idea is not new, as far as manufactured gas is concerned, this is thought to be the first instance where any real success has come with natural gas as motive power.